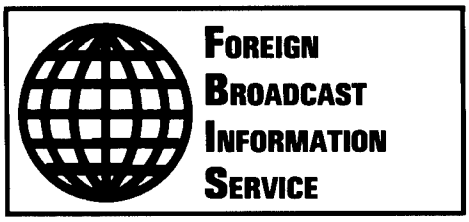
JPRS-ULS-92-020
4 AUGUST 1992



JPRS Report

Science & Technology

Central Eurasia: Life Sciences

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Emergency Service in Uzbekistan

927C0432A Tashkent MEDITSINSKIY ZHURNAL UZBEKISTANA, in Russian No 4, Apr 92 pp 68-70

[Article by P. R. Menlikulov, R. G. Mukhamediyarova, and R. P. Shufutinskaya; Ministry of Health of the Republic of Uzbekistan; under the title: "The Condition and Prospects for the Development of Emergency Medical Aid in the Republic of Uzbekistan"; under the rubric: "Public Health Organization"; UDC 616.26-006.04]

[Text] Emergency medical assistance occupies an important place in the general system of primary medical-sanitary assistance to the population. The health of people depends in many respects on the efficiency and qualification of emergency medical aid specialists.

The emergency medical aid service is a broad network of stations (substations) and departments of emergency medical aid, sanitary aviation, and emergency medical care hospitals.

The material-technical base of this service has been strengthened somewhat in recent years; the number of physicians and middle-level medical workers has increased significantly; mobile resuscitation units, portable radios, modern instruments and equipment (apparatus for artificial pulmonary ventilation, for nitrous oxide anesthesia, oxygen inhalator, etc.) have been placed at their disposal. In some cities a direct connection has been forged with the State Motor Vehicle Inspectorate [GAI] and the militia.

More than seven million of the population of the republic (or 339.5 per 1,000; in 1989, 332.5) annually receive urgent and emergent medical assistance.

The frequency with which the republic's population request emergency medical aid by reason of sudden illnesses or conditions is 255.2 per 1,000. In Namanganskaya Oblast, this rate is 312.3; in Surkhandarinskaya Oblast, 334.6; in Syrdarinskaya Oblast, 505.0; in Tashkentskaya Oblast, 316.7; and in Ferganskaya Oblast, 320.8.

A low level at which the population sought emergency medical aid for this reason is observed in Samarkandskaya (157.8) and Bukharaskaya (158.7) Oblasts, and in Karakalpakstan (189.9). The rate at which emergency medical aid is sought depends first and foremost on the accessibility of this service, territorial characteristics, the state of communications, and the organization of ambulatory-polyclinic care.

The rate at which emergency medical aid is sought for accidents is 14.5 per 1,000 in the republic. In Dzhizakskaya Oblast this rate is 49.8; in Namanganskaya Oblast, 15.4; in Andizhanskaya, 15.5; and in Tashkentskaya, 20.0. A low level at which the population seeks emergency medical aid for accidents is observed in Khorezmskaya (5.7) Oblast, in Surkhandarinskaya Oblast (8.0) and in Karakalpakstan (10.5). In the structure of the rate at which the population seeks emergency medical aid the following predominate: sudden illnesses (83.2 percent), accidents (4.2 percent), labor and pathology of pregnancy (3.5 percent), etc. Among the sudden illnesses the following predominate: diseases of the cardiovascular system (50.1 percent), viral respiratory infections (14.0 percent), acute surgical diseases (11.0 percent) and diseases of the respiratory organs (9.0 percent).

A tendency has been noted in the republic in recent years for the organization of specialized emergency medical aid teams. The total number of such teams at the beginning of 1991 was 364 (in 1986, 262). Steps have been taken toward the organization of intensive therapy teams, the number of which has reached 92 by 1991 (in 1986, 80).

The organization of affiliates of departments (stations) of emergency medical aid of the CDH [central district hospitals] [TsRB] in district hospitals and in rural medical outpatient units has been practiced in the rural areas over the course of a number of recent years. This has made it possible (in addition to call operations) to actively serve patients at home, especially at night. Physicians and feldschers of RDH [rural district hospitals] [SUB], RMOU [rural medical outpatient units] [SVA], and MC [midwifery centers] [FAP] are working for additional pay in such affiliates. As a result it has been possible to maintain and even reduce the number of patients serviced by a single team (in 1991, 11.5 per day; in 1989, 12.0 persons per day).

It should be noted that the number of calls serviced by feldschers remains high. Thus in 1990, the proportion of feldschers was 53.0 percent out of the total number of calls (in 1989, 51.7). In Syrdarinskaya Oblast this rate was 71.5 percent; in Dzhizakskaya, 66.2 percent; in Tashkentskaya, 73.7 percent; in Andizhanskaya, 54.9 percent; and in Karakalpakstan, 68.9 percent.

This situation is explained by the low level of staffing of the service with emergency medical aid physicians, and by the high turn-over of personnel. The supply of the urgent medical services motor vehicles with portable radios, the efficient work of the dispatcher service, and the well-organized mechanism of the conjoint work of the medical teams and the ambulatory-polyclinic institutions are of no small significance. The extent of the technical equipment of the emergency medical aid departments (stations) of the agricultural regions remains low. There are no respirators, no electrocardiographs, portable radios, etc. on the emergency service vehicles.

The number of calls at emergency medical aid stations (departments) for the servicing of chronically ill patients has not declined. This is associated with the fact that there are no special services for patients who are at home after discharge from the hospital, but who are in need of prolonged therapy, the provision of a complex of necessary medical assistants, active home nursing, and medical care in the terminal stage of an illness in the ambulatory-polyclinic institutions.

The home medical care centers (departments) which were created in 1988-1989 in many polyclinics of Tashkent, Bukhara, Samarkand, and Andizhan have not been adequately developed. Therefore, it is necessary to organize a special service for the provision of home medical care, active home nursing for patients in need of emergent medical assistance and symptomatic therapy, etc. in the polyclinics. The effectiveness of an emergency medical aid

service depends in many respects on the efficient development and emplacement of a network of emergency medical aid stations and departments, the efficient operation of a dispatcher service, etc. In this connection it is necessary to create emergency medical aid stations (substations) in thickly-populated residential complexes, as well as affiliates of emergency medical aid departments in all RDH [rural district hospitals] [SUB] and RMOU [rural medical outpatient units] [SVA] which are more than 20 km from the central district hospital [TsRB], to furnish the motor vehicles with portable radios, and to organize the connection between the urgent care teams and the hospital institutions.

Specialized medical care provided to patients suffering from severe illnesses and to individuals suffering from accidents at the pre-hospital stage, as well as the improvement of a rapid diagnostic service, should become a new direction in the development of the emergency medical aid service. The creation of intensive therapy teams, along with the specialized teams, takes on considerable significance in this connection.

While strengthening the material-technical base of the emergency medical aid service, one of the paramount tasks, the complete staffing of the service with physicians, their training, the upgrading of qualifications, as well as the necessity of a telephone intercom between urgent care stations (departments), the militia, the State Motor Vehicle Inspectorate [GAI] , and the fire department, etc. must not be forgotten.

It is necessary to create the necessary manufacturing, daily living services, and material conditions for the successful solution of the problem of the supply of medical personnel for the emergency medical aid service.

When the public health system shifts to new economic conditions, the emergency medical aid service should be provided for out of the state budget.

Callus Formation and Regeneration of Cotton *Gossypium hirsutum* L. (Sort 108-F)

927C0433B Moscow FIZIOLOGIYA RASTENIY in Russian Vol 39 No 2, Mar-Apr 92 (manuscript received 02 Oct 90) pp 365-370

[Article by T. V. Kolganova, D. K. Shrivastava, V. L. Mett, and E. S. Piruzyan, Molecular Genetics Institute, Russian Academy of Sciences, Moscow; UDC 581.15:581.143.5]

[Abstract] The objective of this investigation was to determine the conditions necessary for the callus formation and regeneration of cotton plants (*G. hirsutum* sort 108-F). Callus formation was induced from the hypocotyls and cotyledonous leaves of shoots. The effects of phytohormones in concentrations recommended for callus formation induction and combinations of growth regulators were tested. It was shown that callus growth was most rapid on explants obtained from four to six day old shoots. Callus growth was also rapid when the calluses were transferred to a medium containing the defoliant dropp. Overall, the results demonstrated that the effectiveness of callus formation greatly depends on the origin of the explant. It was also found that callus formation induction is more effective when hypocotyls are used as opposed to cotyledonous leaves. In addition, it was observed that differentiated structures developed only from tissues obtained from hypocotyls. In conclusion, the morphogenic potential of callus formation depends on the origin of the explant. Figures 3; tables 2; references 19: 5 Russian, 14 Western.

Accelerating the Sprouting of Seeds Via Processing in Electrochemically Activated Water

927C0442D Kiev FIZIOLOGIYA I BIOKHIMIYA KULTURNYKH RASTENIY in Russian Vol 23 No 6, Nov-Dec 91 (5 Dec 90) pp 552-556

[Article by O. A. Pasko, Siberian Botanical Gardens, Tomsk State University imeni V. V. Kyubyshev; UDC 581.142]

[Abstract] The seeds of many cultivated plants contain growth inhibitors that are in the pod, the endosperm, or the pericarp and that are adsorbed by the soil if the seeds remain buried for a lengthy period of time. Sprouting time can be accelerated by soaking the seeds in water. However, prompted by the fact that activated water stimulates growth and development in plants, the researchers examined the effects of electrochemically activated water on length of presowing treatment of seeds. The water was in the form of a catholyte, an anolyte, or a mixture of the two. The seeds consisted of Phlomis, coreopsis, and sugar cane with a chemically induced dormancy. Optimum soaking times and Ph values for the media varied with the seed. Phlomis, for example, required a slight acid medium, whereas the coreopsis needed a neutral medium, and the cane, a slightly alkaline medium. Sprouting rates generally increased with soaking time, but dropped off sharply after three hours for the tap water and after one to three hours for the activated water. Figures 2, references 13: 11 Russian, 1 Western, 1 Hungarian.

Electron Microscopy of α-Latrotoxin From *Latrodectus mactans tredecimguttatus* Black Widow Spider Venom

927C0278A Moscow BIOORGANICHESKAYA KHIMIYA in Russian Vol 17 No 8, Aug 91 (manuscript received 26 Dec 90) pp 1021-1026

[Article by A. V. Lunev, V. V. Demin, O. I. Zaytsev, S. I. Spadar, and Ye. V. Grishin; Institute of Bioorganic Chemistry imeni M. M. Shemyakin, USSR Academy of Sciences, Moscow; UDC 591.145.2-544:537.533.37]

[Abstract] The structure of α-latrotoxin two-dimensional crystals from *Latrodectus mactans tredecimguttatus* black widow spider venom was studied by negative stain electron microscopy. The crystals were obtained by adsorbing the protein from a solution with a high concentration of Mg^{2+} ions onto an electron microscope grid that had been coated with a carbon film. These crystals had a diameter of up to 0.4 μm and gave rise to sharp optical diffraction, which allowed the authors to conduct Fourier-filtration of the images on a computer. A contour map of the distribution of contrast stain in the two-dimensional crystal was obtained with a resolution of 4 nm. It was established that the crystals belonged to the *p*4 two-sided planar symmetry group. The unit cell parameters were as follows: a = b = 15.55 nm, γ = 90°. Calculation of the molecular weight of the protein portion of the crystal unit cell, taking into account the fourth order symmetry axis, indicated that the latrotoxin portions, observed as negative contrast, consisted of four or eight protomers. Figures 4; references 16: 3 Russian, 13 Western.

Effect of Ammonium Ions on the Conversion of Organic Matter Into Methane

927C0278B Moscow PRIKLADNAYA BIOKHIMIYA I MIKROBIOLOGIYA in Russian Vol 27 No 3, May-Jun 92 (manuscript received 19 Jul 89) pp 442-453

[Article by Ye. S. Pantskhava, Ye. G. Sachkova, N. V. Gorbunova, and E. F. Brin; Institute of Biochemistry imeni A. N. Bakh, USSR Academy of Sciences, Moscow; Institute of Chemical Physics, USSR Academy of Sciences, Moscow; UDC 576.8]

[Abstract] The effects of 9.7, 19.4, 29.1, 38.8, and 48.5 mM ammonium chloride solutions on the thermophilic (53° C) bioconversion of chicken manure with a moisture content of 95 percent into methane were studied in this work. It was shown that exogenous addition of ammonium ions inhibited the formation of methane but not carbon dioxide. The degree of inhibition depended on the ammonium ion concentration and fermentation time; with increased fermentation time, the degree of methane inhibition decreased. The authors proposed that ammonium ions could be regulators of methane formation in methane-generating ecosystems. Figures 4; references 13: 8 Russian, 5 Western.

Localization of the Antigen Determinant of Recombinant Interleukin-2, Recognized by 13B1 Monoclonal Antibodies

927C0281A Moscow BIOORGANICHESKAYA KHIMIYA in Russian Vol 17 No 6, Jun 91 (manuscript received 21 Jun 90, after revision 29 Nov 90) pp 725-731

[Article by V. A. Skrivelis, Yu. P. Bundulis, A. V. Panyutich, N. N. Boytenok, V. Ye. Lunev, V. A. Nesmeyanov, A. Yu. Tsimanis, and E. Ya. Gren; Institute of Molecular Biology, Latvian SSR Academy of Sciences, Riga; NII [Scientific Research Institute] of Blood Transfusion, Belorussian SSR Ministry of Public Health, Minsk; Institute of Bioorganic Chemistry imeni M. M. Shemyakin, USSR Academy of Sciences, Moscow; UDC 577.112.083.3]

[Abstract] Previously, the authors had produced 13B1 monoclonal antibodies against recombinant interleukin-2 that did not have a neutralizing effect. In hopes of using these antibodies in an immunochemical approach to studying the structural-functional organization of human interleukin-2 (IL-2) molecules, the authors proposed a method for approximately localizing the antigen determinant of IL-2 in this work. The method was based on restricted trypsinolysis of the recombinant protein, separation of the formed peptides by the O'Farrell method, identification of the peptides bonded to the monoclonal antibodies against recombinant IL-2, and comparison of experimentally obtained data on the length and charge of these peptides to data on the theoretically possible peptides for conditions of restricted trypsinolysis. With the aid of this approach, the authors localized the antigen determinant recognized by 13B1 monoclonal antibodies. Figures 4; references 19: 5 Russian, 14 Western.

Use of Synthetic Supports and Adjuvants To Improve the Immunogenicity of Synthetic Peptide B-Epitope From *Plasmodium falciparum* CS-Protein

927C0281B Moscow BIOORGANICHESKAYA KHIMIYA in Russian Vol 17 No 6, Jun 91 (manuscript received 24 Jul 90) pp 732-746

[Article by B. B. Ivanov, Ye. A. Meshcheryakova, T. M. Andronova, and V. T. Ivanov; Institute of Bioorganic Chemistry imeni M. M. Shemyakin, USSR Academy of Sciences, Moscow; UDC 577.112.083.3]

[Abstract] Increasing the immunogenicity of antigen material involves a different set of problems in each case of developing a vaccine preparation or producing a hyperimmune serum. The goal of this work was to design completely synthetic, highly immunogenic structures based on peptide B-epitope. Results of the authors' studies of the feasibilty of improving $(NANP)_3$ peptide's immunogenicity with the aid of synthetic supports and immunomodulators were presented. The authors synthesized a series of peptide conjugates with KLH protein and the following synthetic supports: maleic anhydride-vinylpyrrolidone copolymer (MAVP), branched poly-*D,L*-alanyl-polylysine (pAL), and polytuftsin $(RTKP)_n$. Tests of the conjugates' ability to induce anti-$(NANP)_n$-antibody formation were conducted on two mouse lines, one that responded to the peptide polymer $(NANP)_{40}$ without a support (C57B1/6) and one that did not respond to this antigen (BALB/C). Conjugates based on poytuftsin with the covalently bonded glycopeptide adjuvant GMDP induced a higher titer of antibodies than the peptide conjugate with KLH. Introduction of a T-helper epitope into the conjugates' structure or addition of a tuftsin dimer to the peptide's N-terminal led to the production of immunogenic structures. Figures 3; references 21: 5 Russian, 16 Western.

Conformational Analysis of Tachikinins. II. N-Terminated Fragments of Phylomedusin, Eledosin, Kasseinin, and Neurokinins

927C0281C Moscow BIOORANICHESKAYA KHIMIYA in Russian Vol 17 No 6, Jun 91 (manuscript received 3 Aug 90) pp 747-755

[Article by A. Ya. Avanov; Institute of Biochemistry, Armenian SSR Academy of Sciences, Yerevan; UDC 547.962.541.63]

[Abstract] The independent physiological activity of the N-terminated fragment of substance P is not observed in the corresponding fragments of other tachikinin representatives; however, the other tachikinins exhibit substance P's activity to a greater or lesser degree when intact. It is known that neural membranes contain different protein receptors for different tachikinins, which enables the membranes to distinguish between tachikinins structurally, based on regions of specific binding sites on the neurons. In order to elucidate the role of structure in tachikinin activity, the authors conducted a theoretical conformational analysis of N-terminated fragments of the tachikinin peptides phylomedusin, eledosin, kasseinin, and neurokinins A and B in this work. It was shown that the fragments were similar to analogous fragments from other tachikinins, i.e., they were very labile conformationally. Possible stereo forms of these fragments were in conformational equilibrium and could easily interconvert, which made it impossible for the authors to isolate a predominant conformational state. Figures 10; references 13: 1 Russian, 12 Western.

Effective Synthesis and Cloning of the Human Interleukin-2 Gene and Its Analogue; Expression of the Interleukin-2 Gene in *E. coli* Cells

927C0281D Moscow BIOORGANICHESKAYA KHIMIYA in Russian Vol 17 No 6, Jun 91 (manuscript received 11 Jan 90, after revision 10 Sep 90) pp 779-788

[Article by N. K. Danilyuk, S. V. Seregin, A. N. Sinyakov, O. I. Serpinskiy, I. N. Babkina, M. A. Urmanova, V. A. Ryabinin, and S. G. Pozdnyakov; All-Union Scientific Research Institute of Molecular Biology; NPO [Scientific Production Association] "Vektor," USSR Ministry of the Medical Industry, Koltsovo, Novosibirsk Oblast; UDC 577.213.7]

[Abstract] In this work, two-stranded DNA fragments encoding the human interleukin-2 gene (IL-2) sequence and its analogue (with a deletion of 14 amino acid codons from the 3'-terminal) were constructed. The synthetic genes were obtained from partially complementary synthetic polynucleotides by means of extending them with DNA-polymerase I (Klenov fragment), cloning the obtained DNA-duplexes in specially designed pFH-type plasmid vectors, which allowed the authors to isolate the cloned fragments with predetermined 5'-specific "adhesive" terminals by excising them with FokI and other restriction endonucleases, and subsequently ligating the entire sequence in one or two steps. The biological activity of the synthetic IL-2 gene expression product was determined by testing the T-cell proliferation activity of *E. coli* cell lysates containing the IL-2 expression plasmid pEXIL2. Figures 2; references 25: 8 Russian, 17 Western.

RNA Synthesis With T7 RNA-Polymerase and Immobilized DNA in a Flow Reactor

927C0281E Moscow BIOORGANICHESKAYA KHIMIYA in Russian Vol 17 No 6, Jun 91 (manuscript received 21 Jun 90, after revision 4 Oct 90) pp 789-794

[Article by A. A. Yolov, Ye. M. Volkov, and Z. A. Shabarova; Moscow State University imeni M. V. Lomonosov, Chemistry Department; UDC 577.213.3]

[Abstract] In a previous work, the authors demonstrated for the first time the basic feasibility of synthesizing RNA by means of transcribing a DNA-matrix (covalently bonded to a polymer support) with T7 phage RNA-polymerase, which could form the basis of a new technological method for synthesizing predetermined RNA. In this work, an immobilized DNA-matrix, containing T7 phage RNA-polymerase promoter and coding for a 14-membered oligoribonucleotide, was produced by assembling synthetic oligodeoxyribonucleotides with DNA-ligase on polymer supports. It was shown that RNA could be synthesized in a flow-type reactor with the aid of this matrix. Sepharose 4B and Toyopearl HW-55 were used as supports. Figures 1; references 12: 6 Russian, 6 Western.

Determination of Rubber Polymerase Activity in the Presence of a Model Seed

927C0282A Moscow PRIKLADNAYA BIOKHIMIYA I MIKROBIOLOGIYA in Russian Vol 27 No 4, Jul-Aug 91 (manuscript received 1 Nov 89) pp 491-497

[Article by O. A. Yevdokimova, A. V. Karchevskaya, N. G. Sosnovskaya, A. V. Shcheulin, and V. V. Moiseyev; Voronezh Branch, All-Union Scientific Research Institute of Synthetic Rubber; UDC 678.4+573]

[Abstract] A necessary component in a system for determining rubber polymerase activity is the seed—washed rubber particles with allyl pyrophosphate groups on their surfaces. A model seed (MS) was produced on the basis of synthetic liposomes made of egg phospholipids and a low molecular weight prenyl phosphate—geranyl pyrophosphate (GPP). It was shown that MS binds to ^{3}H-isopentenyl pyrophosphate (IPPP) in the presence of B fraction proteins isolated from Hevea serum. Polymerization of ^{3}H-IPPP in the presence of MS and B fraction proteins led to the formation of long-chain (greater than C_{20}) prenyl pyrophosphates. The MS is of interest as a first step in the development of an artificial system for biosynthesizing polyprenol compounds. Figures 2; references 15: 2 Russian, 13 Western.

Adsorption of *Pseudomonas fluorescens* 16N2 Cells Onto Cellulose Triacetate Fibers

927C0282B Moscow PRIKLADNAYA BIOKHIMIYA I MIKROBIOLOGIYA in Russian Vol 27 No 4, Jul-Aug 91 (manuscript received 12 Oct 89) pp 508-513

[Article by Ye. I. Kozlyak, Z. G. Solomon, M. M. Yakimov, T. V. Fadyushina, I. S. Rogozhin, G. I. Germanskiy, I. B.

Utkin, B. L. Biber, and A. M. Bezborodov; Institute of Biochemistry imeni A. N. Bakh, USSR Academy of Sciences, Moscow; NPO [Scientific Production Association] "Khimvolokno" ["Chemical Fibers"], Mytishchi; UDC 579.24]

[Abstract] The adsorption of *Pseudomonas fluorescens* 16N2 (VKPM V-3343—a hydrocarbon destructor strain) bacterial cells onto cellulose triacetate (CTA) fibers was studied in this work to determine its feasibility for immobilizing live bacterial cells on fiber carriers. The dependence of biomass content on the fiber on the density of bacteria in contact with the suspension carrier was described by the Langmuir equation, which suggested a monolayer packing of the sorbent surface by cells. Despite the purely physical character of adsorption, the cell loading limit reached 85 +/- 10 mg of absolute dry biomass (ADB) per 1 g of dry carrier. A portion of the biomass (10 +/- 0.5 mg ADB/g carrier) bound so strongly that water did not wash it away from the fibers during long-term (three hours) incubation. Mechanical and adsorptive methods of cell immobilization were compared. Figures 3; references 19: 7 Russian, 12 Western.

Construction of Carriers Based on Natural Polysaccharides for *Arthrobacter globiformis* Cells With 1,2-Steroid Dehydrogenase Activity

927C0282C Moscow PRIKLADNAYA BIOKHIMIYA I MIKROBIOLOGIYA in Russian Vol 27 No 4, Jul-Aug 91 (manuscript received 2 Nov 89) pp 514-522

[Article by G. V. Sukhodolskaya, N. G. Vinokurova, S. A. Gulevskaya, K. A. Koshcheyenko, and G. K. Skryabin; Institute of the Biochemistry and Physiology of Microorganisms, USSR Academy of Sciences, Pushchino; UDC 579.23.222.4]

[Abstract] A study of the feasibility of producing new carriers based on Ca-alginate gel for immobilizing *Arthrobacter globiformis* 193 cells with 3-keto-steroid-Δ^1-dehydrogenase activity was conducted in this work. A Ca-alginate-acidified insoluble starch heterogel was constructed in which cells remained morphologically intact upon immobilization. The rate of hydrocortisone transformation by cells incorporated in the heterogel corresponded to the rate of substrate transformation by cells in a Ca-alginate gel. In contrast to the Ca-alginate gel, the heterogel, at an optimum Ca-alginate to acidified starch ratio of 4:3 (wt/wt), essentially did not adsorb to steroids and exhibited higher mechanical strength. The stability of the 1,2-dehydrogenation process increased more than 1.5 times with use of the heterogel. Figures 4; references 16: 8 Russian, 8 Western.

Degradation of 2-Nitrobenzoic Acid and Other Aromatic Compounds by the *Pseudomonas pseudoalcaligenes* Strain

927C0282D Moscow PRIKLADNAYA BIOKHIMIYA I MIKROBIOLOGIYA in Russian Vol 27 No 4 (manuscript received 7 Dec 89) pp 571-576

[Article by A. D. Mironov, V. Yu. Krestyaninov, V. I. Korzhenevich, I. Ya. Yevtushenko, and A. L. Barkovskiy; Saratov Branch, All-Union Scientific Research Institute of the Genetics and Selection of Industrial Microorganisms; Institute of the Biochemistry and Physiology of Plants and Microorganisms, USSR Academy of Sciences, Saratov; UDC 579.6]

[Abstract] In this work, the morphological, culturing, and physiological-biological properties of a *Pseudomonas pseudoalcaligenes* strain isolated from soil were described. The strain is capable of degrading a large number of aromatic compounds, including 2-nitrobenzoic acid (2-NBA), whose metabolism begins with reduction of the NO_2-group under the influence of a nonspecific nitrate reductase that is also capable of reducing inorganic nitrates to ammonia. It was shown that nitrate reductase activity occurs only after induction of the cells with a nitroaromatic compound. The obtained strain can be used in biotechnological systems for purifying waste water of nitroaromatic compounds, which are widespread environmental pollutants. Figures 6; references 17: 9 Russian, 8 Western.

Growth of Methylotrophic Bacteria on Methyl Acetate

927C0282E Moscow PRIKLADNAYA BIOKHIMIYA I MIKROBIOLOGIYA in Russian Vol 27 No 4, Jul-Aug 91 (manuscript received 29 Sep 89) pp 584-588

[Article by D. Yu. Rakov, N. V. Doronina, Yu. A. Trotsenko, and R. M. Aliyeva; Institute of the Biochemistry and Physiology of Microorganisms, USSR Academy of Sciences, Pushchino; Institute of Microbiology and Virology, Kazakh SSR Academy of Sciences, Alma-Ata; UDC 579.222.7]

[Abstract] Methyl acetate is used as a solvent in the manufacture of varnishes, coatings, glues, etc. Since information on microbial degradation of methyl acetate has been nonexistent until recently, the authors of this work studied the mechanisms of pseudomonad growth on methyl acetate, accomplished by various C_1-metabolism pathways. It was shown that *Pseudomonas* species (sp.) 27RD and 24RA grow on methyl acetate, utilizing it as a source of carbon and energy. Both strains had inducible carboxyl esterase that catalyzed the hydrolysis of methyl acetate to methanol and acetate. *Pseudomonas* sp. 27RD simultaneously utilized both hydrolysis products. On the other hand, *Pseudomonas* sp. 24RA assimilated acetate more actively than methanol with the latter gradually accumulating in the medium and limiting growth. *Pseudomonas* sp. 27RD had methanol dehydrogenase (KF 1.1.99.8), while this enzyme was absent in *Pseudomonas* sp. 24RA; its low rate of methanol assimilation was due to weak alcohol oxidase activity. The inhibiting effect of methanol was removed upon addition of the obligate methylotroph *Methylobacillus methanolovorus*. Figures 5; references 6: 1 Russian, 5 Western.

The Mobile Genetic Element 'Jockey' Codes for a DNA-Polymerase Similar to Retrovirus Reverse Transcriptases

927C0376A Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 320 No 2, Sep 91 (manuscript received 22 May 91) pp 473-476

[Article by V. A. Ivanov, A. A. Melnikov, A. V. Siunov, I. I. Fodor, and Yu. V. Ilyin, corresponding member USSR

Academy of Sciences; Institute of Cell Biophysics, USSR Academy of Sciences, Pushchino, Moscow Oblast; Institute of the Biochemistry and Physiology of Microorganisms, USSR Academy of Sciences, Pushchino, Moscow Oblast; Institute of Molecular Biology imeni V. A. Engelgardt, USSR Academy of Sciences, Moscow; UDC 577.215.3]

[Abstract] Mobile genetic elements of the LINE class, which are long and partially replicate the DNA sequence, are found in the genomes of various eukaryotes. These mobile elements and their mechanisms of transposition are involved in genome organization and organism evolution. The currently accepted model of LINE-element transposition is based on reverse transcription of RNA intermediates, which involves proteins that code for these elements. Therefore, the identification and study of these proteins' functional activity are of critical importance. The authors had previously cloned an original copy of the mobile element "jockey" from the drosophila genome, sequenced it, and determined its structural organization and coding potential. They hypothesized that "jockey" was a LINE class element similar to retrovirus reverse transcriptases. The goals of this work were to clone and express "jockey" in *E. coli* and to study it further. The authors found that like retrovirus reverse transcriptase, the "jockey" recombinant DNA-polymerase preferred poly(rA) and poly(rC) as matrices and was not effective in reactions with activated DNA. These DNA-polymerases could utilize a methylated poly(rC^m) matrix that was highly specific for retrovirus RNA-dependent DNA-polymerases. In this work, the authors conclusively demonstrated for the first time that the mobile genetic element "jockey" is a LINE-element, that it codes for DNA-polymerase, and that it is similar to retrovirus reverse transcriptase. Figures 2; references 14: 3 Russian, 11 Western.

Periodic and Aperiodic Oscillations in Neuropeptide Receptor Binding in Cell Culture

927C0376B Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 320 No 2, Sep 91 (manuscript received 18 Jun 91) pp 481-484

[Article by T. K. Sukhomlin, Ye. M. Melikhova, I. N. Kurochkin, and S. D. Barfolomeyev; presented by Academician D. G. Knoppe 18 Jun 91; All-Union Center for Molecular Diagnostics and Treatment, Moscow; UDC 577.156]

[Abstract] The intense study in recent years of the properties of cell receptors has made it possible to identify important regulatory mechanisms of the kinetic behavior of membrane receptor systems such as modulation of the level of specific binding of ligands to sodium, calcium, and magnesium ions and guanyl nucleotides and their analogues. In this work, a new regulatory property of cellular enzyme-receptor complexes, manifested in the appearance of periodic and aperiodic oscillations in the binding of δ-opioid receptor agonists to NG108-15 cell culture suspensions, was discovered. Detailed kinetic functions (25-70 points during a one minute interval) were obtained of the binding of δ-opiate ligands [3H] DSLET ([^{3}H]-(2-*D*-serine-5-*L*-leucine-6-*L*-threonine)enkephalin), [3H]DADLE ([^{3}H]-(2-*D*-alanine-5-*D*-leucine)enkephalin), and [3H]DPN ([^{3}H]-diprenorphine) to NG108-15 cell suspensions, to membrane vesicle suspensions in a culture medium (exosomes), and to membrane preparations of cells, exosomes, and rat brain. The kinetic functions of [3H]DADLE binding with NG108-15 cell suspensions could be divided into three characteristic types: 1) exponential, 2) with periodic oscillations, and 3) with aperiodic oscillations, suggesting strange attractor behavior in biochemical systems. In order to identify the factors responsible for the appearance of periodic or aperiodic oscillations or, on the other hand, for their deterioration in exponential form (the usual form for binding kinetics), the authors directly varied cell culture conditions and conditions for conducting the kinetic experiments. The occurrence of three types of kinetic curves, differing in modeled exponential function parameters and statistical criteria, verified the fact that the receptor complex may exist in at least two different states—one that is capable and one that is incapable of regulating its receptor properties. The state that is incapable of regulation determines the exponential form of the kinetic functions and is manifested in the kinetics of agonist or antagonist binding to the various suspensions. Results obtained in this work verified the discovery of a new property of cellular receptor systems—periodic or aperiodic oscillations in agonist receptor binding and the absence of oscillations in antagonist binding. Oscillations in receptor-stimulated cell responses had been described previously—respiratory rupture, changes in cell shape, and oscillations in the microfilament content of human blood neutrophils *in vivo*. Figures 1; references 9: 5 Russian, 4 Western.

Highly Active Alkaline Phosphatase From Marine Bacteria

927C0376C Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 320 No 2, Sep 91 (manuscript received 18 Jun 91) pp 485-487

[Article by Yu. V. Fedosov, V. V. Mikhaylov, I. I. Zhigalina (deceased), Ye. P. Ivanova, V. B. Kozhemyako, N. B. Onopriyenko, V. A. Rasskazov, and Academician G. B. Yelyakov; Pacific Ocean Institute of Bioorganic Chemistry, Far East Department, USSR Academy of Sciences, Vladivostok; UDC 577.155.2]

[Abstract] *Escherichia coli* alkaline phosphatase (orthophosphoric acid monoester phosphohydrolase) is used in the first stage of two-step enzymatic synthesis of labeled nucleic acid molecules. However, removal of the *E. coli* phosphatase from the reaction medium by means of heat inactivation is difficult due to the high stability of this enzyme. Previously, a thermolabile alkaline phosphatase had been isolated from Antarctic marine bacteria and characterized. The phosphatase was easily removed from the reaction with heat treatment (60° C, 10 min.). In order to identify the strains of microorganisms that produced the alkaline phosphatase, the authors of this work studied the phosphatase activity of cells from 142 strains of marine bacteria-symbionts, marine invertebrates, and free forms of bacteria filtered from sediment and seawater. Highly active alkaline phosphatase was

found in 12 strains. Several properties of highly active alkaline phosphatase isolated from the marine Gram-negative bacteria *Alteromonas macleodii*, strain 40MS, in the marine microorganism collection (KMM 162) at the Pacific Ocean Institute of Bioorganic Chemistry, Far East Department, USSR Academy of Sciences, are described in this work. The authors noted that this phosphatase could be used for rapid preparation of labeled nucleic acid molecules and in immunological investigations. Figures 3; references 5: 2 Russian, 3 Western.

BSA-Polyalkylene Oxide Conjugates: Novel Vehicles for Transporting Dihydroriboflavin Ethers Into Mitochondria

927C0438B Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 319 No 4, Aug 91 (manuscript received 24 May 91) pp 1008-1011

[Article by I.A. Gorskaya, M.V. Bushuyeva, B.I. Kurganov, I.N. Topchiyeva, V.P. Ivanova, I.G. Panova and I.P. Rudakova, Institute of Biochemistry imeni A.N. Bakh, USSR Academy of Sciences; Moscow State University; "Vitaminy" Scientific Industrial Association, Moscow; UDC 576.342+113.47+577.112.342+577.164.12]

[Abstract] Trials were conducted on facilitation of ingress into mitochondria of benzaflavin (2',3',4',5'-tetrabenzoyl-5-acetyl-1,5-dihydroriboflavin), a hydrophobic derivative of dihydroriboflavin, by BSA and BSA-based water-soluble conjugates. The carriers were prepared by conjugation of BSA with polyethylene glycol (PEG) and the block copolymer proxanol (ethylene oxide + propylene oxide). Studies with rat heart mitochondria demonstrated that BSA and the BSA-PEG conjugate were equally effective as transporters with coefficients of proportionality on the order of 0.31 (g mitochondrial protein/L)$^{-1}$. The corresponding coefficient for the BSA-proxanol conjugate was 0.96 (g mitochondrial protein/L)$^{-1}$, and its greater solubilization potential for benzaflavin was attributed to lower affinity binding of benzalflavin to the conjugate than to BSA and the BSA-PEG molecules and, hence, easier release. Figures 3; references 15: 8 Russian, 7 Western.

Generalized Mechanism for Irreversible Inhibition of Cholinesterases by Organophosphorus Inhibitors

927C0440B Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 318 No 2, May 91 (manuscript received 16 Jan 91) pp 459-466

[Article by R.S. Agabekyan and V.S. Lyubimov, Institute of Physiologically Active Substances, USSR Academy of Sciences, Chernogolovka, Moscow Oblast; UDC 577.152.311.042]

[Abstract] Kinetic studies were conducted on the inhibition of cholinesterases by 200 irreversible organophosphorus inhibitors in an attempt to derive a more definitive mechanistic explanation of their mechanism of action. Analysis of the inhibition plots obtained with human erythrocyte acetylcholinesterase (EC 3.1.1.7) and equine serum butyrylcholinesterase (EC 3.1.1.8) suggest a mechanism involving rapid initial inactivation of the enzyme-inhibitor complex in addition to phosphorylation of the serine residue at the active center. Nevertheless, departure of the plots from linearity in certain cases indicate that a more complicated mechanism cannot be excluded. Figures 2; tables 1; references 12: 6 Russian, 6 Western.

Amino Acid Sequences of Structural Proteins of Attenuated and Pathogenic VEE Virus Strains

927C0440E Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 318 No 6, Jun 91 (manuscript received 09 Apr 91) pp 1488-1491

[Article by I.V. Frolov, A.A. Kolykhalov and V.Ye. Volchkov, All-Union Scientific Research Institute of Molecular Biology, Koltsovo, Novosibirsk Oblast; UDC 577.152.321:577.113.5]

[Abstract] Comparative studies were conducted on the amino acid sequences of structural proteins of the Soviet and American variants of the pathogenic Trinidad donkey strain of the VEE virus, as well as attenuated (vaccine) strains TC-83, CM-23 and 230. Sequence data on proteins C, 6K, E1 and glycoprotein E2 revealed a series of variations, some correlated with pathogenicity. Major differences were noted in sequence 209-216 of glycoprotein E2, including loss of glycosylation site in the attenuated strains. However, definitive interpretation of the significance of amino acid exchanges for pathogenicity will require genetic engineering of the entire VEE viral genome, as has been accomplished with the Sindbis virus. Figures 1; tables 2; references 6: 2 Russian, 4 Western.

Spectral Luminescent Properties of Native Oat Phytochrome Inserted Into Polymer Matrix

927C0423A Moscow BIOFIZIKA in Russian Vol 37 No 2, Mar-Apr 92 (manuscript received 07 Feb 91) pp 222-225

[Article by G. V. Lyakhnovich, G. V. Kozhuk, A. A. Sukhodola, A. V. Dorokhin, V. A. Lapina, and I. D. Volotovskiy, Physics Institute, Belarus Academy of Sciences, Minsk; Photobiology Institute, Belarus Academy of Sciences, Minsk]

[Abstract] The objective of this investigation was to research the possibility of immobilizing highly purified preparations of native oat phytochrome in 7.5, 25, and 40 percent polyacrylamide gel (PAAG) matrices. The results demonstrated that using PAAG concentrations of 7.5 percent or less made it possible to spectrophotometrically identify the chromoprotein in the matrix, even though up to 50 percent of it was lost during polymerization. It was also shown that the phytochrome was capable of repeated reversible phototransformation. Spectral measurements performed at room temperature revealed two absorption bands typical for an aqueous solution of this chromoprotein at 660 and 730 nm. In addition, a short wave band at 570 nm and luminescence at 590 nm appear in the absorption spectrum of the phytochrome in the matrix. These absorption and luminescence bands of phytochrome in the PAAG matrix with their mirror symmetry suggest that they have the same absorption and radiating center. The nature of these bands has not been conclusively determined, but it appears that a complex forms with a transfer of charge between acrylamide and tryptophan residues of the phytochrome during the matrix polymerization process. In conclusion, the data indicate that insertion of native phytochrome into a PAAG matrix is accompanied by modification of the spectral properties of the chromoprotein, as evidenced by the appearance of a new band of absorption at 570 nm and a luminescence band at 590 nm. Figures 1; references 10: 5 Russian, 5 Western.

Computer Model of 'Sense of Humor.' II. Implementation in Neural Networks

927C0423B Moscow BIOFIZIKA in Russian Vol 37 No 2, Mar-Apr 92 (manuscript received 09 Aug 91) pp 325-334

[Article by I. M. Suslov, Physics Institute imeni P. N. Lebedev, Russian Academy of Sciences, Moscow]

[Abstract] This study proposes the possible use of a "sense of humor" algorithm in a system of formal neurons. The realization of a sense of humor necessitates a rather complex, organized system consisting of associative memory, a sensory system, a reaction system, and a center to coordinate the work. This system, the Hopfield model of neural networks, can be adapted for processing a continuous succession of polysemantic images; the humor is a side effect. Figures 5; references 10: 7 Russian, 3 Western.

Effect of Polarization of EHF Emissions on Efficiency of Electron Transport in Quinone Cofactors of Photosynthetic Reaction Centers

927C0440A Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 318 No 2, May 91 (manuscript received 25 Feb 91) pp 450-453

[Article by Ye.P. Lukashev, A.A. Kononenko, P.P. Noks, V.I. Gayduk, B.M. Tseytlin and O.V. Betskiy, Moscow State University; Institute of Radiotechnology and Electronics, USSR Academy of Sciences, Fryazino, Moscow Oblast; UDC 577.3]

[Abstract] Phosynthetic reaction centers isolated from Rhodobacter sphaeroides were exposed to plane polarized EHF electromagnetic radiation (EMR) to test the effects of polarization on the efficiency of electron transport in the quinone components. The control results demonstrated that EHF EMR shifted the A_2/A_1 ratio in a manner indicating greater contribution of the slow component. The data, then, were consistent wuth greater efficience of electron transport in the quinone system Q^-_A-Q_B -Q_A-Q^-_B. Efficiency was much greater with perpendicular orientation of the planes of polarization and was attributed to enhanced libration of polar molecules and groups in stereochemical contact with the ubiquinone cofactors. Figures 2; references 7: 5 Russian, 2 Western.

Physicochemical Forms of Radionuclides in Fallout After the Accident at Chernobyl and Their Transformation in the Soil

927C0452 Moscow ATOMNAYA ENERGIYA in Russian Vol 71 No 5, Nov 92 pp 449-454

[Article by Ts. I. Bobovnikova, Makhonko K. P., Siverina A. A., Rabotnova F. A., Gutareva V. P., Volokitin A. A., Institute of Experimental Meteorology, NPO Tayfun; UDC 551.510.2:550.378:681.41:551.578]

[Abstract] A considerable part of the radioactive products released in the Chernobyl accident consisted of particles of nuclear fuel and structural materials. The chemical composition of the release was affected by what was dropped by helicopter onto the core. On the morning of the accident (26 April), there were virtually no easily accessible forms of ^{90}Sr recorded. That form of ^{90}Sr had increased eight-fold by 28 April, but was a third to a half of the maximum by 30 April. Levels dropped an additional 20 percent in the second half of June. Unlike ^{90}Sr, two forms of cesium (^{134}Cs and ^{137}Cs) had levels of easily accessible forms that made up 30 percent of the radionuclide content on 26 April and 6 percent in late June. The ranges of easily accessible forms of ^{106}Ru and ^{144}Ce were wider, moving from roughly 50 percent on the day of the accident to 2 percent and 0.3 percent. Over the next two years, the mobility of the ^{90}Sr grew sharply. The ratio of easily accessible ^{137}Cs to its opposite form remained the same, and the transformation of the physicochemical forms of ^{106}Ru and ^{144}Ce in the soil was similar to that of ^{137}Cs. The levels of easily accessible ^{106}Ru grew four- to five-fold over the two-year period. Soil samples taken 12 km from the Chernobyl plant, upstream of the Pripyat River confirmed the transformation of the physicochemical forms of the radionuclides. Analysis of soil layers taken at Chernobyl and Benevka indicate that it is primarily the easily accessible forms that migrate at depth. The physicochemical forms of the radionuclides in samples taken 1-4 May 1986 in Minsk, Gomel, Vitebsk, and Cherkassy and the Baryshevka region (near Kiev) differed little from the Chernobyl samples taken for that period. References 6: 5 Russian, 1 Western.

The Chernobyl Plant Accident: Contamination of Herbaceous Plants. Practical Aspects

927C0454A Minsk IZVESTIYA AKADEMII NAUK BELARUS. SERIYA FIZIKO-ENERGETICHESKIKH NAUK in Russian No 1, Jan-Mar 92 pp 5-10

[Article by N. V. Yeliashevich, Institute of Radiobiology, Academy of Sciences of Belarus; UDC 574.4/5:539.163]

[Abstract] One technique for producing uncontaminated plant and animal products on land that is still in use, but was contaminated as a result of the Chernobyl accident is to choose plants that have a lower accumulation of radionuclides than do traditional farm crops. A total of 188 species of feed and medicinal plants were examined in 1987-90 in the southeastern part of Belarus. Gamma-spectrometric analysis was performed on 2,500 plant and soil samples; radiochemical analysis for ^{90}Sr was performed in 520 samples. In areas with a ^{137}Cs contamination of 5 Ci/sq km, only 60 percent of the species studied yielded a relatively "clean" phytomass (2×10^{-8} Ci/kg air-dried mass). A total of 21 species (or 11.2 percent) presented a hazard in terms of radiation (mainly forest and swamp plants). A total of 54 species (28.7 percent) were termed "high-risk"—species of the lowland marshes, species of meadow growth, and certain legumes. With contamination levels at 15 Ci/sq km, nearly a third of the species yielded contaminated phytomass. Some 38 percent of the species were considered high-risk. Radionuclide accumulation in a given species, however, varied with location. ^{137}Cs accumulations were found to be lower in 97 species than in the traditional meadow *Phleum pratense* L. ^{90}Sr accumulations in 85 species were roughly twice as high in above-ground phytomass than were the ^{137}Cs accumulations. Figures 2, references 3: Russian

Satellite Monitoring and Normative Prognosis for Ecosystem Dynamics in Amudar Delta

927C0455A Sverdlovsk EKOLOGIYA in Russian No 5, Sep-Oct 91 (manuscript received 11 Mar 90) pp 3-8

[Article by B.V. Vinogradov, D.Ye. Frolov and V.A. Popov, IEMEZh [expansion unknown] imeni A.N. Severtsov, USSR Academy of Sciences; Department of Geography, Uzbek SSR Academy of Sciences; UDC 531.3:574.9]

[Abstract] Data obtained in sequential satellite (Salyut-4) monitoring in 1975, 1980 and 1985 were subjected to analysis by Markov's heterogenous chain model to predict long-term sequelae for the ecosystem in the Amudar delta. The model addressed the following four factors: stable ecosystems, substable ecosystems (indistinct changes), dynamic ecosystems (distinct changes), and irregular ecosystems (uncontrolled natural catastrophies and/or anthropogenic impact). The forecasts point to gradual desertification of the Amudar delta, with an increase in the desert-solonchak area from 38 percent in 1985 to 75 percent (3700 km^2) by 2010. Concomitantly, the grassland-tugai area can be expected to show a three-fold decrease from 48 to 12 percent in that timeframe. Figures 1; tables 1; references 11: 6 Russian, 5 Western.

Radiation Injuries of Pine in Chernobyl Area

927C0455B Sverdlovsk EKOLOGIYA in Russian No 5, Sep-Oct 91 (manuscript received 20 Feb 90) pp 28-33

[Article by Yu.D. Abaturov, N.I. Goltsova, N.S. Rostova, A.V. Girbasova, A.V. Abaturov and P.N. Melankholin, Silviculture Laboratory, USSR Academy of Sciences; Biological Scientific Resarch Institute, Leningrad State University; UDC 632.1818.3.582.47:581:33]

[Abstract] Histomorphological studies were conducted on pine needles as part of Chernobyl radiation damage assessment, using exposed pine stands five to six km from Chernobyl in the westerly direction and, as controls, stands 40-50 km in the southeasterly direction. The exposed pines absorbed doses ranging from 0.2 to 2.0 krads, a factor directly correlated with an increase in the incidence and severity of anomalies. In general, radiation injuries were most serious in areas where most of the trees and dormant cones were killed. Key observations included growth of single needles (25 percent of samples) and growth in bundles of three (35 percent) vis-a-vis a normal growth pattern in

bundles of two. Single needles—an observation that has previously been unreported—tended to be cylindrical and 1.5- to two-fold longer and thicker than normal. Figures 1; tables 2; references 9: Russian.

Physicochemical Characteristics of Soil Plutonium in Areas Affected by Chernobyl Fallout

927C0455E Sverdlovsk EKOLOGIYA in Russian No 5, Sep-Oct 91 (manuscript 25 Dec 90) pp 79-81

[Article by I.Ya. Popova and R.I. Pogodin; UDC 539.163:574.4]

[Abstract] Studies were conducted on the physicochemical characteristics of Pu in soil samples polluted by the Chernobyl fallout. The results showed that the percentage of Pu found exchangeable/acid soluble (depending on leaching acid) ranged from 2.2 to 10.6 percent within 2-5 km of Chernobyl, 9.1-13.5 percent at 20-30 km, and 17.3-22.4 percent at 180-260 km. The data also demonstrated that in the immediate zone of pollution Pu mobility was extremely low and, accordingly, bioaccumulation can also be expected to be low. Pu was also found to be bound to the amorphous phase of soil, i.e., organic acids and their congeners, which coat mineral particles. Finally, within the 30 km zone ca. 40 percent of Pu was bound to < 0.05 mm diameter particles, increasing to > 70 percent at more distant locations. The $^{90}Sr/Pu$ ratios in the 30 and > 60 km zones were, respectively, 160 and 31. Figures 1; tables 1; references 4: Russian.

Chronic Irradiation from Chernobyl Fallout and Dandelion Seed Viability

927C0455F Sverdlovsk EKOLOGIYA in Russian No 5, Sep-Oct 91 (manuscript received 16 Aug 90) pp 81-84

[Article by V.N. Pozolotina, P.I Yushkov and N.V. Kulikov, Institute of Plant and Animal Ecology, UrO [expansion unknown], USSR Academy of Sciences; UDC 577.391.58.039.1]

[Abstract] Dandelion (Taraxacum officinale) seeds collected in 1988 in the Chernobyl area were used in assessing viability of subsequent generations. The experimental seeds had been exposed to backround gamma radiation levels on the order of 0.2 to 19.0 milliroentgen/h in 1988, with control seeds coming from an area with a 4.0-17.0 milliroentgen/h backround. The resultant findings demonstrated significant deterioration of seed viability in direct proportion to irradiation, including sub-baseline seed weight, depressed rate of germination, and dimininished tolerance of repeated irradiations. The resultant plants grew and developed at a slower pace and presented with a higher incidence of various anomalies than dandelions from control seeds. These observations exceeded the incidence of abnormalities seen with seeds irradiated in 1986, indicating accumulation of genetic lesions over the subsequent generations. Figures 1; tables 2; references 6: 5 Russian, 1 Western.

Journalist Doubts Conversion of Yekaterinburg Laboratory

927C0522 Moscow MOSCOW NEWS in English, 7-14 Jun 92 p 8

MN Investigation

The Russian President's recent Decree "On Ensuring Fulfilment of International Commitments in the Field of Biological Weapons" has indirectly confirmed what has, actually, not been a secret for some time: the Soviet Union acted for years counter to the Convention "On Banning the Development of Biological and Bacteriological Weapons" ratified by it in 1975. The authorities have still not dared openly to admit the existence of three secret centres (in Kirov, Sergiyev Posad and Yekaterinburg) where the dangerous viruses used to be grown and where a bacteriological Chernobyl occurred long before the radioactive Chernobyl

Rose-Coloured Cloud

On April 4, 1979, the Sverdlovsk ambulance service operators came under a hurricane of phone calls. The calls came from the certain neighbourhoods and the symptoms given were similar: temperatures being as high as 41°C, cough, vomiting. The local hospital was soon filled to capacity, and the victims were taken to a neighbouring one. Most patients died, moreover at a moment's notice, speaking clearly and distinctly to the doctor a minute before their death. Towards evening it became clear that the initial diagnosis—pneumonia—had been incorrect. The city had been hit by an outbreak of anthrax.

The disease hit the neighbourhoods located to the south of the so-called 19th military cantonment. The wind was blowing precisely in that direction on the previous day. Some claimed to have seen an emission in the shape of a rose-coloured cloud rising beyond a tall barbwired fence between five and six p.m. on the previous day. Almost the entire shift of the ceramics factory, located next to the cantonment, was taken to the hospital. And although the cantonment's leadership said that they had nothing to do with the incident, medics started answering to the calls wearing antiplague suits and gas masks. The city was panic-stricken, and relatives refused to bury their kith and kin.

During this emergency the Sverdlovsk KGB department behaved as ought to be expected. As admitted by its former chief, General Yuri Kornilov, prior to April 1979 he did not even know what the cantonment was concerned with because the latter's leadership took orders directly from the General Staff. Therefore for two more weeks during the epidemic, the regional KGB department continued scavenging burial grounds for fallen cattle and trying to catch spies, while paying not the slightest attention to what not only the whole of Sverdlovsk but also foreign radio broadcasts were saying.

But the broadcasts demonstrated rare unanimity: in defiance of the convention, they said, the USSR was busy developing bacteriological weapons as evidenced by the outbreak of an anthrax strain in the 19th military cantonment on an outskirt of Sverdlovsk.

'Meat' Version

Anthrax is a terrible weapon—not the natural one which originates from direct contact with sick animals (as a rule it is easily cured), but its sister—developed in a test tube. For the strain attacking the lungs, the lethal outcome is not lower than 80 percent and death is almost instantaneous—in six to eight hours.

At that time, in spring 1979, most of the cases died from the lung form which caused a brain haemorrhage of the "Hippocratic cap" type.

A State Commission led by Pyotr Burgasov, Deputy Minister of Public Health, Chief State Sanitary Physician of the USSR, arrived in Sverdlovsk. By that time the KGB department had already concluded its searches. True, they had found no spies, but a couple of Americans, who happened to be in the closed city for unknown reasons, were expelled from the country. As for the investigation of the reason of the epidemic, the vigilant bodies immediately found a peasant who had sold the meat of an anthrax-infected cow on the local market. This fact was given as the basis of the official—"meat"—version of the epidemic's origin voiced in the press by the pundits I. Bezdenezhnykh and V. Nikiforov.

If, accepting their version, it is presumed that the villagers suddenly started slaughtering their cows in spring and, bypassing the sanitary service, selling the meat on the market, then whence the lung form of anthrax? After all, the intestinal form, as I have said above, was contracted by a few persons, quite possibly due to the meat of that same cow which security people had found (or "organized").

Two months later the epidemic ended taking a toll of 64 human lives, according to official figures. They were buried in accordance with a special instruction of the sanitary epidemiological service in the loam of the eastern part of the cemetery, with bleaching powder poured on the coffins. On the master plans for building the city this place is marked with a red cross to prevent construction work being started here even many decades later.

No Help—For Want of Desire?

It is only now, eleven years later, that light is being shed on the details of that tragedy, leaving no stone unturned in the official version. Some of them have already been cited by KOMSOMOLSKAYA PRAVDA and IZVESTIA, but there are also new facts:

There is an eloquent story of an anthrax vaccine which hit people in Sverdlovsk. It was brought from Tbilisi and inoculated not only those already sick, but also the inhabitants of adjoining neighbourhoods. It seemed that the meat of one cow had been eaten by at least 3,000 persons. Incidentally, the State Commisioin itself, it seems, did not have too much faith in the "meat" version. Otherwise why would Burgasov have insisted on treating the contaminated neighbourhoods from the air, and on washing roofs with soap solution and caustic soda?

One more paradox: among the more than 500 hospitalized persons there were almost no inhabitants of the 19th canonment itself. It would seem that this absolves the secret laboratory from the slightest suspicions. The contrary is, alas, the case.

Under somewhat clandestine circumstances I got hold of an ampule full of a dark brown liquid manufactured in the cantonment. In the ampule was live anthrax vaccine. When I phoned Anatoly Kharchenko, chief of the cantonment, he said with pride that their liquid vaccine was much more effective than the dry one from Tbilisi. "Regrettably," the general observed, "we no longer produce it." He also lamented that in 1979 the military had not been involved in combatting the epidemic. "It's a pity—we could have rendered real assistance."

The point is that in April 1979 all of the cantonment's inhabitants and personnel were inoculated with the liquid, local vaccine. It was all the more effective as it had been grown from the kind of anthrax which was affecting the citizens. The vaccine did not go any farther than the cantonment, and the rest of Sverdlovsk inhabitants were inoculated with the Tbilisi vaccine—hardly suitable for those conditions. Moreover—another seven persons lost their lives due to it. During the autopsy the vaccinal strain, in addition to the main one, was found in these people, it had aggravated the disease.

I have at my disposal the text of ex-Defence Minister Dmitry Yazov's reply to an inquiry from Oleg Kravets, deputy to the Sverdlovsk City Council. Yazov writes: "The above-mentioned facility in Sverdlovsk (the 19th canonment) is a structural subunit of the Research Institute of Microbiology under the USSR Ministry of Defence—a sector of military epidemiology. This institution concerns itself with work in the field of the antibacteriological defence of troops and the population, notably, developing methods and means for the disinfection of terrain, military hardware, weapons and equipment, means for protecting people against biological aerosols and for the early detection of noxious substances in the environment."

It sounds solid, doesn't it? But we know that terrain disinfection was carried out not by the cantonment's specialists, but by Burgasov's Commission which unprofessionally raised conataminated dust into the air by its washing of roofs and thus caused a new wave in the epidemic. Due to improper disinfection, the anthrax was not wiped out in Yekaterinburg—it hid itself in the soil which was rolled over with asphalt and is waiting.

Thus, the culprits were reluctant to become rescuers, for which many of the unsuspecting people paid with their health or even lives. Non-rendering of aid, as we all know, is also a crime. Although everything can be simply explained, the military were sitting snug to ward off suspicion.

No More Secrets?

Today security people are extremely outspoken. According to their information, the tragedy occurred because one of

the secret laboratory's staff members started work, forgetting to switch off the electronic filter for the ventilation system thereby scattering the anthrax over a vast area. Yuri Andropov was said to be drafting a resolution on compensation to citizens who suffered during the epidemic. This resolution, unrealized at that time, has been embodied in Boris Yeltsin's April Decree "On Improving Pension Maintenance for the Families of Citizens Who Died in Consequence of Falling Ill with Anthrax in Sverdlovsk in 1979".

But General Kharchenko has stubbornly continued denying his centre's involvement in the above-mentioned events. When I made reference to the state security service, he irritably advised security people to mind their own business and not discredit the army. According to his words, the cantonment is now geared exclusively for medical needs and is going to produce antibiotics and artificial blood substitutes. All this is wonderful, but for some reason he did not permit me to visit this strictly scientific laboratory—this, he said, requires permission from the General Staff.

I have been to the cantonment nevertheless—without the general's help, it is true. Three- and five-story houses, a copy of a Moscow project, stand behind the fence. Its population is roughly between 10,000 and 15,000. The entrance to the territory is guarded by soldiers, and armed patrols with dogs are pacing the strip along the fence at night. Of late the place has been conveted by people interested in making it a co-op—there is neither racket nor thieving. The secret laboratory is enclosed in a separate fence with barbed wire, and a special pass with a multitude of stamps is required to get in. Incidentally, considering the amount of crime in Yekaterinburg, the idea of removing the guard has evoked protests from the cantonment's inhabitants themselves. Although, there is virtually no need for him once bacteriological weapons are no longer being developed there.

Query Instead of Fullstop

To "confess", "repent","punish"—are these most important things to do? Recall that, first, anthrax has not been eliminated in the Urals. Second, according to some information, the death laboratory is still alive—it has merely changed its location. Who can vouch that an epidemic, the source of which cannot be easily explained, will not break out tomorrow somewhere not far from Irkutsk? After all, an outbreak of plague, which hit a herd of yaks, did occur not long ago on the border with Mongolia. In short, instead of a fullstop, a query is still appropriate. Will this story be continued?

Status of Biological Lab Remains Unclear

92WN0660A Moscow NEZAVISIMAYA GAZETA in Russian 1 Jul 92 p 6

[Letter to NEZAVISIMAYA GAZETA from Damir Safulin: "Will the Secret Laboratory Not Move From Kazakhstan to Russia? The Bacteriological 'Sand Dune' on Vozrozhdeniye Island Continues To Alarm the Public"]

[Text] I read in your newspaper for 23 June 1992 an article by Sergey Kozlov which discussed the bacteriological laboratory on Vozrozhdeniye Island in the Aral Sea. The article is entitled "Scientists Have Abandoned Secret Laboratory." It says there: "The doors and windows of the residential buildings, barracks, and the laboratory facility itself have been boarded up since last year."

My son, Vladimir Safulin, who was recruited into the army in June 1991, requested to serve precisely in Aralsk-5 and on this very Vozrozhdeniye Island, which in the unit (military unit 25484-R, which is part of a larger unit located in the city of Aralsk-5) and in the Russian General Staff is called "Sand Dune." Quartered on the island last year was a whole regiment, in which my son, the commander of a division of 54 men, served.

After a great deal of difficulty he and his subordinates were ultimately transferred to Moscow. In order to accomplish this, we—a group of parents—had to push our way through to get a meeting with General Shukalin in the General Staff. What caused the parents to demand a transfer to Russia was something traditional for our army—hazing and the increasingly frequent cases of beating up on military servicemen (even officers) by the local population. My son's division was transferred to Moscow on 26 April 1991.

And so military servicemen were still quartered on the "Sand Dune" at the end of April. To be fair, one must say that by that time there was really no civilian population there.

S. Kozlov's article quotes the words of Mukhtar Shakhanov, president of the "Aral-Asia-Kazakhstan" international committee: "The laboratory on the island is still operating." The statement was made in January 1992. I assume that my information about the "boarded-up" barracks would make one think that Shakhanov was right. Apparently the laboratory was "mothballed" in approximately the same way as the barracks were "boarded up." This assumption is reinforced by the fact that, as was stated in the article, beginning in 1992 scientific research work will be conducted on the island by the duty-shift method. This in a supposedly mothballed laboratory! Another quote: "In November 1991 at a scientific conference in Sergiyev Posad a decision was adopted to finally terminate testing work on the island."

Has it never occurred to the readers of the article what kind of relationship the Moscow-area Sergiyev Posad (the former Zagorsk) has to the Aral? The most direct. The fact is that Sergiyev Posad is where the command of the military unit quartered in Aralsk-5 is located. And when they set out for Moscow the entire division was offered a chance to continue their service in Sergiyev Posad, but the boys refused.

But that is not the main thing. The main theme of the article was that the bacteriological testing ground is closed because of public protests. Is that true? As I went through the various levels of authority asking for my son and his men to be transferred out of Kazakhstan (a different country) to serve in Russia, I made my way to the Committee on Affairs of Military Servicemen under the president of Russia, where I was told plainly that the Russian higher military echelons had adopted a decision to transfer all Russian units out of the territories of the former Union republics.

Moreover, the entire Aralsk-5 unit was gradually transferred to Russia, since Kazakhstan is creating its own army. Consequently, the closure of the "Sand Dune" is in no way linked to public protests.

God forbid if along with the unit they were to move the sinister "Sand Dune" with its "mothballed" laboratory to the territory of Russia.

Two Outbreaks of Foodborne Hepatitis A

927C0445A Moscow ZHURNAL MIKROBIOLOGII, EPIDEMIOLOGII I IMMUNOBIOLOGII in Russian No 1, Jan 92 (manuscript received 22 Nov 90) pp 19-22

[Article by M.D. Aleynik, K.V. Blokhin, I.M. Chikovitova, T.A. Koval, L.P. Sokolova, T.D. Tkachuk, A.A. Rabechina, A.M. Makarova, Z.G. Makatdisova, A.A. Gubernatorova, O.V. Tuzov and A.K. Yefimov, Scientific Research Institute of Epidemiology and Microbiology, Nizhniy Novgorod]

[Abstract] Epidemiologic studies on two outbreaks of hepatis A (HA) in the Kaliningrad Oblast in 1990 encompassed 104 and 189 cases in the towns of Sovietsk and Ivanono, respectively. In both situations the oubreaks were traced to sun-cured melons from Central Asia shown to have been subjected to fecal contamination at the source. The melons had been procured in the Ashkahbad and Tashau oblasts of Turkmenistan where HA morbidity is high. References 2: Western.

Rodent Mobility in Kama River Region of Urals

927C0455C Sverdlovsk EKOLOGIYA in Russian No 5, Sep-Oct 91 (manuscript received 26 Dec 88) pp 33-41

[Article by V.V. Demidov, Perm State University; UDC 599.32:591.5]

[Abstract] One to four month observations were conducted on individual movement patterns of four types of rodents during the 1981-1983 reproductive season in the vicinity of the Kama River (Kishertskiy Rayon, Perm Oblast) in the Ural region. The study involved wood (Apodemus sylvaticus) and field (A. agrarius) mice, and red (Clethrionomys glareolus) and common (Microtus arvalis) voles and demonstrated that a common behavioral pattern prevails. Basically, the individual animals can be divided into migrant and residential individuals, with the latter accounting for 2-48 percent of the population density. The migrants usually remain for 2-19 days in a given locality, the duration being determined by population density and nature of the habitat. The migrants can be further divided into mostly rapid and a smaller contingent (16-25 percent) of slow migrants. In addition, certain migrants exhibit cyclic migratory patterns by revisiting older sites. Figures 1; tables 3; references 39: 30 Russian, 9 Western.

Bithyniidae Populations in Areas of Sverdlovsk Oblast Endemic for *Opisthorchosis*

927C0455D Sverdlovsk EKOLOGIYA in Russian No 5, Sep-Oct 91 (manuscript received 21 Nov 89) pp 62-69

[Article by D.N. Ponomarev and I.M. Khokhutkin, Institute of Plant and Animal Ecology, UrO [expansion unknown], USSR Academy of Sciences; UDC 594.32:591.67]

[Abstract] An ecological and biological assessment was conducted in 1987-1988 on populations of *Codiella troscheli* and *Bithynia tentaculate.* These two snail species are of particular interest since they serve as intermediate hosts in areas of the Sverdlovsk Oblast endemic for *opisthorchosis* (esp. in the vicinity of Tobol River). Population dispersion and age distribution analyses demonstrated that variations in these parameters are largely predicated on chronographic fluctuations in the limnological situation with respect to season, anthropogenic interventions, etc. In the final analysis, the conclusion was clear that the actively reproducing subset of the snails in question is the major link in the "helminth-intermediate host-auxiliary host-definitive host" axis in maintaining *opisthochosis* in the eastern reaches of the Sverdlovsk Oblast. Figures 1; tables 2; references 23: 20 Russian, 3 Western.

Physical Map of Genome of *Cyanobacterium Synechocystis* sp. PCC 6803

927C0429A Moscow GENETIKA in Russian Vol 28 No 4, Apr 92 (manuscript received 25 Sep 91) pp 46-52

[Article by I. N. Shalak, I. V. Yelanskaya, and M. Yu. Fonshteyn, Moscow State University imeni M. V. Lomonosov; Institute of General Genetics imeni N. I. Vavilov, Russian Academy of Sciences, Moscow; UDC 577.13:582.232]

[Abstract] A physical map of the genome of the *cyanobacterium Synechocystis* sp. PCC 6803 was constructed via pulse electrophoresis. *Synechocystis* sp. PCC 6803 is the model generally used for the study of the genetics of oxygen photosynthesis. Most of the genes known to control the synthesis of the structural components of the photosynthesis apparatus have been cloned, but genetic mapping of those genes is limited, because of the absence of systems of transduction and conjugational transfer. Pulse electrophoresis was used because it makes it possible to map bacterial chromosomes and to locate the various genes on them through hybridization. In fact, Western researchers have recently mapped the nitrogen-fixing *Anabaena* sp. PCC 7120. In the work reported here, the researchers used restriction endonucleases that split the chromosomal DNA of *Synechocystis* sp. PCC 6803 into rather large fragments. Recognition sites for restrictases Not1, Eco72.1 (PmaC1), and Mlu1 were identified. The size of the genome, based on the sum of the lengths of the restriction fragments, is 3300 +/- 90 kbp, which is close to the size ascertained by Vermaas with reassociation kinetics. Figures 4, references 10: 2 Russian, 8 Western.

Producing Monosomal Lines Containing Individual Human 15, 21, and X Chromosomes

927C0429B Moscow GENETIKA in Russian Vol 28 No 4, Apr 92 (manuscript received 16 May 91) pp 125-131

[Article by L. D. Matyakhina, N. S. Zhdanova, N. M. Matveyeva, A. G. Shilov, S. D. Pak, and O. L. Serov, Institute of Cytology and Genetics, Siberian Department, Russian Academy of Sciences, Novosibirsk; UDC 575.191:575.222.7]

[Abstract] Researchers used *in situ* hybridization with ^{3}H-labelled total human DNA on metaphase chromosome preparations for analysis of hybrid human-rodent clones. The method makes it possible not only to determine the number of human chromosomes in the hybrid clones, but also to identify the translocations of the human genetic material onto the partner chromosomes. The researchers employed the hybridization with electrophoretic analysis of a number of human chromosome labels and with cytogenetic analysis to choose three hybrid clones bearing individual 15, 21, and X chromosomes from among 100 clones produced in a series of experiments involving hybridization of human and rodent cells. The work made use of four human fibroblast lines (Nos. 814, 821, 1021, and 1344), human blood leukocytes, the Ag17-1 Chinese hamster and A9 mouse reinoculated fibroblast lines (deficient in hypoxanthine phosphoribosyl transferase), and the LMTK^{-} mouse line (deficient in thymidine kinase). Figures 4, references 2: Western.

Cloning Efficiency of Some Plant DNAs in Various Vector Systems

927C0433A Moscow FIZIOLOGIYA RASTENIY in Russian Vol 39 No 2, Mar-Apr 92 (manuscript received 03 Apr 91) pp 239-248

[Article by T. F. Gurova, D. A. Los, and V. Ye. Semenenko, Plant Physiology Institute imeni K. A. Timiryazev, Russian Academy of Sciences, Moscow; UDC 577.21.31]

[Abstract] The cloning efficiency of various species (*Chlorella* sp. K, *Dunaliella salina*, wheat *Mironovskaya 808*) was compared in vector λL47 and a novel cosmid vector. The vector fragments produced were unable to form dimers, thus precluding the formation of a polycosmid background that did not bear insertions, a fundamental advantage of cloning in the new cosmid. It was shown that cloning of bacterial and algal DNA in the λ-vector produced a number of clones that agreed with theoretical calculations and was adequate for searching for unique genes of these organisms for the gene banks. However, cloning of wheat DNA in the λ- vector did not yield enough recombinant clones for a representative bank of this complex genome. These data indicate that the novel cosmid vector is more effective than λL47 for cloning wheat DNA. This novel cosmid vector, the cloning efficiency of which is four-fold higher than the original, can also be used for producing gene banks of phage φKZ, *D. salina* algae, and wheat to produce yields comparable to those theoretically calculated for representative banks. In conclusion, the novel cosmid vector can be used to effectively clone various types of DNA. The resultant cosmid banks of plant DNA may undoubtedly be used for researching the organization of many multi-gene families, their location on the chromosome, and the organization of repeating units. Figures 6; tables 1; references 26: 6 Russian, 20 Western.

Molecular Hybridization Using Parallel Complementary Probes

927C0438A Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 319 No 4, Aug 91 (manuscript received 20 May 91) pp 999-1002

[Article by N.A. Churikov, A.K. Shchekkina, O.F. Borisova and B.K. Chernov, Institute of Molecular Biology imeni V.A. Engelgardt, USSR Academy of Sciences, Moscow; UDC 575.85+577.21]

[Abstract] Trials were conducted with parallel complementary DNA probes to test their usefulness in delineating mirror duplexes in various genomes. The fundamental studies were performed with hot points on the *Drosophila* genome "cut" locus accomodating "gypsy" mobile element, using 40 bp (23 AT, 17 GC pairs) parallel and conventional antiparallel synthetic probes. Both probes bound ethidium

bromide with equivalent affinities and displayed identical rotational relaxation times. Blot hybridization of restriction fragments confirmed the utilility of the parallel probe in detection of parallel complementary sequences in gene libraries. Additional confirmation of the usefulness of parallel probes was obtained with a 45 bp probe complementary to *Drosophila* DNA suffix sequence and with a 40 bp probe corresponding to the *E. coli* "lon" gene. Accordingly, the technique has been shown to be useful for detection of DNA sequences that are complementary in the parallel direction. The temperature of hybridization can be calculated by assuming a temperature jump of 0.5° for every GC pair and a gradient of 1°C for every AT pair in the hybrid complex. Figures 3; references 15: 5 Russian, 10 Western.

Retinal Error Signal Determines Parameters of Saccadic Movement of Eyes With Head in Fixed Position

927C0444A Moscow SENSORNYYE SISTEMY in Russian Vol 5 No 4, Oct-Dec 91 (manuscript received 18 Apr 91) pp 93-99

[Article by A. E. Kustov, B. M. Sheliga, V. V. Shulgovskiy, and Yu. B. Kuznetsov, Moscow State University imeni M. V. Lomonosov; UDC 612.846:612.821.1:612.821.2]

[Abstract] It is currently believed that saccadic movement is determined by a signal of the position of the eyes in their orbits that is necessary for the fixation of a visual target. Two means by which this signal may be formed were tested in three subjects aged 25-30 years. The subjects were instructed to press a button and move their glance as soon as possible to the lighted light-emitting diode (LED) and release the button when the LED began to fade. The stimuli were presented in a horizontal band of LEDs in random order in front of the subject. The control and experimental series consisted of 12-14 blocks of 32 flashes each, with each block separated by a 30 second pause. The data were then processed to obtain average latent periods and amplitudes of saccadic movement of the eyes. The latent period of glance movement was analyzed, since this index characterizes the time necessary for the oculomotor system to determine amplitude and directional movement and makes it possible to explain some mechanisms of saccade organization. The results demonstrated that the initial position of the glance or position of the target did not affect the determination of the saccades, but the amplitude and direction of required movement of the glance yielded a curve of change in the latent period which agrees with that obtained in the control series. Moreover, the average figures for latent periods for each amplitude in the experimental series are considerably lower. In addition, when a second stimulus was presented after a 200 msec delay, the latent periods of saccadic movement in the eyes significantly decreased. These were considered to be short-latent saccades. In conclusion, the average latent period of regular and short-latent saccades was shown to depend on the amplitude of movement rather than initial or final eye position. Figures 4; references 10: 3 Russian, 7 Western.

Ascorbipalmitate: Membrane-Active Antimutagen

927C0440C Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 319 No 1, Jun 91 (manuscript received 19 Mar 91) pp 992-994

[Article by Ye.G. Tyrsina, O.G. Rossikhina, Yu.A. Tyrsin and S.K. Abilev, All-Union Scientific Research Institute of Genetics and Selection of Industrial Microorganisms, Moscow; Troitsk Branch, Institute of Atomic Energy imeni I.V. Kurchatov, Moscow Oblast; Moscow Technological Institute of the Food Industry; UDC 575.224.6]

[Abstract] Ascorbipalmitate (AP), a food additive used extensively abroad, has been tested for antimutagenicity in comparison with ascorbic acid (AC) on Salmonella typhimurium TA100 exposed to N-methyl-N'-nitro-N-nitrosoguanidine. Assessment of his^+ revertants showed that AC was effective only when preincubated with the mutagen. AP was a much more efficient antimutagen whether preincubated with the cells or the mutagen, but particularly when preincubated with the cells. The high efficiency of AP was attributed to its amphiphilic character and partition in the phospholipid layer of the plasma membrane, with the polar AC moiety positioned in the periplasmatic space free to interact with the mutagen. The mechanism by which the mutagen is inactivated, however, remains to be elucidated. Tables 2; references 10: 1 Russian, 9 Western.

Prediction of Antigenic Peptide Structures Corresponding to MHC

927C0440D Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 318 No 4, Jun 91 (manuscript received 30 Nov 91) pp 1013-1016

[Article by Ye.P. Kharchenko and A.E. Dityayev, Institute of Evolutionary Physiology and Biochemistry imeni I.M. Sechenov, USSR Academy of Sciences, Leningrad; UDC 577.112.6+577.27]

[Abstract] Description is provided of an algorithm designed to identify peptide epitope sequences with 90 percent certainty of correspondence to MHC determinants. The specific studies dealt with 14 hexapeptides identified in the literature as behaving as murine IA^d H-2 antigens. Assessment of the physicochemical characteristics of the individual amino acids and their probable positions in the hexapeptide chain demonstrated certain common features identifying them as IA^d H-2 antigenic determinants. Their equifunctionality was determined by their primary structure, linear dimensions, and hydrophobicity and hydrophilicity of the amino acids. Thus, positions one, three, and four are generally occupied by hydrophobic amino acids, while positions two, five, and six by hydrophilic. In addition, aromatic amino acids (phenylalanine, tyrosine, tryptophan)—some of the bulkiest moieties—are never found in position one. In addition, position six is usually occupied by serine and occasionally alanine. In practical terms, this approach may be useful in engineering vaccines with desired specificities, e.g., HIV vaccines. Figures 1; tables 3; references 7: Western.

Synthesis of Recombinant Mouse/Human Antibodies in Lymphoid and Nonlymphoid Cells

927C0440F Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 318 No 6, Jun 91 (manuscript received 12 Apr 91) pp 1500-1503

[Article by S.M. Deyev, B.V. Radko, A. Lieber and O.L. Polyanovskiy, Institute of Molecular Biology imeni V.A. Engelgardt, USSR Academy of Sciences, Moscow; Institute of Molecular Biology, Berlin, Germany; UDC 577.3]

[Abstract] Cursory details are provided on the production of a chimeric mouse/human antibody against transferrin through construction of a tandem of immunoglobulin genes encoding murine variable and human constant regions of light (kappa) and heavy (epsilon) chains. Following amplification of the tandem-bearing plasmid pIG.6ek in *E. coli*, the plasmid was employed for transfection of Sp2/0 myeloma cells derived from mouse B cells, and nonlymphoid CHO Chinese hamster cells. Both cell types produced the antibody, but production by Sp2/0 cells exceeded that of CHO cells, reaching in certain clones 150 ng/ml. Furthermore, only the Sp2/0 cells were capable of effective antibody secretion, a fact which presumably accounts for the lower production level of the CHO cells. Figures 2; references 10: 4 Russian, 6 Western.

Study of the Immunodiagnosis of Soybean Mosaic Virus

927C0442A Moscow SELSKOKHOZYAYSTVENNAYA BIOLOGIYA in Russian No 1, Jan-Feb 92 (manuscript received 20 Jul 89) pp 165-168

[Article by R. V. Lyalko, N. I. Gorbunova, Middle Asian Scientific Research Institute of Phytopathology, Tashkent; UDC 576.807.7:632.38:633.34]

[Abstract] The No. 1 natural viral pathogen for soybeans is soybean mosaic virus, which is transmitted via seed (5-47 percent, depending on the soybean). The techniques available for diagnosis require very specific, highly active antiviral sera. Sera for the mosaic virus with the proper degree of purity, however, are difficult to produce, because soybeans contain a large number of proteins and green and brown pigments that are difficult to remove. The researchers studied the possibility of reproducing and storing the virus in a tissue culture of soy, with an eye to producing pure viral preparations from calluses and using them to prepare diagnostic sera to be used to identify the mosaic virus via EIA. They were ultimately able to use the newly produced sera in the enzyme immunoassay to identify the virus in concentrations of 10-15 ng/ml. Figures 2, references 8: 5 Russian, 2 Western, 1 Japanese.

Possibility and Prospects of Preparing Interferon From Purified Ingredients

927C0442B Tbilisi IZVESTIYA AKADEMII NAUK GRUZINSKOY SSR: SERIYA BIOLOGICHESKAYA in Russian Vol 17 No 6, Nov-Dec 91 (manuscript received 24 Apr 90) pp 418-423

[Article by I. I. Georgadze, N. V. Topuriya, L. G. Tkemaladze, and I. D. Bukhnikashvili, NPO Bakteriofag imeni Eliav, Tbilisi; UDC 619:57876]

[Abstract] Researchers point to the possibility and advisability of using purified medium ingredients to prepare interferon. Native and purified forms of human leukocytic interferon and swine leukocytic interferon based on the use of VBN and Senday virus inductors and protein growth media (plasma, bovine amniotic fluid, and polyglucin) demonstrated the advantage of purified viruses and a protein component for producing active interferon free of high-molecular impurities. Purified, concentrated interferon virus-inductors maintained their biological activity throughout processing and storage. Antiviral activity of the human leukocytic interferon prepared from purified ingredients was found to be 400 U/ml, as opposed to 100 U/ml for control samples produced according to regulation No. 302-82. References 11: 5 Russian, 6 Western.

Natural Killer Cells and Interleukin-2-Activated Killer Cells in Healthy Individuals and Leukemic Patients. Correlation With HLA Complex

927C0442C Tbilisi IZVESTIYA AKADEMII NAUK GRUZINSKOY SSR: SERIYA BIOLOGICHESKAYA in English Vol 17 No 6, Nov-Dec 91 pp 424-428

[Article by N. I. Makhatadze, D. M. Girdaladze, Ts. Sh. Gelikashvili, and I. K. Makhatadze, Scientific Research Institute of Hematology and Blood Transfusion, Georgian Health and Social Security Ministry, Tbilisi; UDC 612.017.1 (479.22)]

[Abstract] Killer cell activity was studied in 48 healthy blood donors and 42 leukemia patients. Average natural killer cell cytotoxicity against K-562 targets in the control population was approximately 52 percent. The same measure in the leukemia patients was some 10 points lower. No statistically significant difference was found in the two groups, in terms of natural killer cell activity. Interleukin-2-activated killer cell activity, however, was significantly higher (P)92 percent. The same was true for the leukemia patients, with a cytotoxicity of roughly 71 percent, some 30 points higher than the cytotoxicity for the natural killer cells. The researchers suggest that a high level of natural killer cell cytotoxicity in leukemia patients may contribute to benign development of the disease. The leukemia patients in the study showed significantly higher levels of HLA-A10 and B40 antigens than did the control subjects. References 20: 1 Russian, 19 Western.

Antibacterial Immunity in Relation to Changing Radiation Backround

927C0445D Moscow ZHURNAL MIKROBIOLOGII, EPIDEMIOLOGII I IMMUNOBIOLOGII in Russian No 1, Jan 92 (manuscript received 04 May 90; in final form 24 Apr 91) pp 33-36

[Article by S.I. Bidnenko, L.V. Nazarchuk, Ye.A. Fedorovskaya, O.B. Lyutko and L.B. Openko, Scientific Research Institute of Epidemiology and Infectious Diseases imeni L.V. Gromashevskiy, Ukrainian SSR Ministry of Health; Scientific Research Institute of Hematology and Blood Transfusion, Kiev; UDC 612.017.1.06:614.876]

[Abstract] Status of antibacterial immunity was assessed in Kiev before and after the 1986 Chernobyl accident, in which the average exposure during the first year was 1.07 rem. Assessment was performed in terms of antibody titers unrelated to immunization or infection, involving a cohort of 2265 persons, largely 20-50 year old men. The average antibody titer in PHI tests against *Proteus mirabilis, Pr. vulgaris, Staphylococcus aureus* α-toxin, and *Pseudomonas aeruginosa* prior to the accident was 1:8. Six months after the accident the mean titer was 1:43, rising to 1:171 after one year, then falling to 1:90 after two years and to 1:74 after three years. Evaluation of the results in relation to ABO blood groups yielded variable results which were difficult to interpret; at one time or another different blood groups were correlated with the highest titers. On balance, the rise in antibacteria antibodies in the population was attributed to the fact that low levels of radiation tend to inhibit T-suppressor cells, facilitating thereby antibody synthesi

Follow-Up Studies on Chernobyl Damage Control Personnel

927C0443B Moscow MEDITSINSKAYA RADIOLOGIYA in Russian Vol 36 No 10, Oct 91 (manuscript received 17 Jan 90) pp 33-36

[Article by A.A. Oganesyan, E.Ye. Ogandzhanyan, I.Ye. Melikyan, S.A. Malikoyan, G.M. Tiroyan, K.V. Asryan,A.K. Abramyan and I.G. Batikyan, Scientific Research Institute of Medical Radiology, Ministry of Health, Republic of Armenia; UDC 616-001.28-02:614.876(477)]-036.8-07]

[Abstract] Clinical follow-up of 1043 Armenian workers, 20-53 years old, involved in clean work at Chernobyl in 1986-1989 revealed a lack of serious pathology. However, the clinical and laboratory studies were consistent with moderate depression of the immune and antioxidant systems as well as "somatization and hypochondriac manifestations related to polymorphic autonomic dysfunctions and asthenic symptomatology." Accordingly, a longer period of observation will be required to fully assess the impact of realtively low-level (ca. 20 rem) exposure to ionizing radiation. Tables 4; references 3: Russian.

Radioprotective Efficacy of 8 Percent Oxygen Gas Mixture in Unfractionated and Fractionated Irradiation of Mouse Kidneys

927C0443C Moscow MEDITSINSKAYA RADIOLOGIYA in Russian Vol 36 No 10, Oct 91 (manuscript received 25 Apr 91) pp 36-39

[Article by A.A. Vaynson and V.V. Ostapenko, All-Union Oncological; Scientific Center, USSR Academy of Medical Sciences, Moscow; Dnepropetrovsk Medical Institute; UDC 616.61-02:615.849.1]+615.849.015.25]

[Abstract] In view of the controversy whether hypoxic gas mixture is equally effective in radioprotection with unfractionated and fractionated x-irradiation, dose modification factors (DMF) were determined in 22-26 g male (CBA x C57Bl)F_1 mice using the kidneys as the target organs. The animals were treated with an oxygen (8.0-8.2 percent)-nitrogen gas mixture beginning two minutes before and during unfractionated (13-21 Gy) or fractionated (30-40 Gy) irradiation of the kidneys, and subsequent renal monitoring for up to 32 weeks. The results showed that the hypoxic gas mixtures were essentially equally effective with unfractionated and fractionated irradiation, yielding a DMF of 1.25-1.33. Figures 4; tables 3; references 19: 10 Russian, 9 Western.

Physicochemical and Biological Factors Affecting Stability of Bdellovibrio-Bacterial Host Aggregates

927C0437A Moscow MIKROBIOLOGIYA in Russian Vol 61 No 2, Mar-Apr 92 (manuscript received 25 Dec 90) pp 201-201

[Article by A.V. Afigenova, A.L. Shorokhova and N.Yu. Markelova, Institute of Biochemistry and Physiology of Microorganisms, Russian Academy of Sciences, Pushchino; UDC 579.835.91.04]

[Abstract] Stability of aggregates formed by Bdellovibrio sp. ARL-1 and its host bacterium *Pseudomonas fluoprescens* BKM B-1471 were tested for stability when challenged with a number of physiochemical and biological factors. Analysis of size distribution spectra demonstrated that stability was improved by sodium and magnesium ions and polyethylene glycol. Aluminum ions, methanol, ethanol, propanol, and butanol diminished stability. In addition, conglomerastes formed by bdelloplasts were found stable on challenge by mechanical and thermal forces, ultrasonication, and treatment by surfactants, pronase, endogluconase, and sodium periodate. The data were consistent with an interpretation that stability was predicated on hydrophobic interactions, supported by the demonstration that the exopolysaccharide production by parasitized bacteria was significantly enhanced. Figures 1; tables 2; references 11: 5 Russian, 6 Western.

Resistance of Yeast Cells to Desiccation

927C0437B Moscow MIKROBIOLOGIYA in Russian Vol 61 No 2, Mar-Apr 92 (manuscript received 22 Jun 90) pp 214-222

[Article by V.Ya. Volkov, B.V. Sakharov, V.D. Shchepkin, G.N. Fedyukina and A.A. Kashuba, All-Union Scientific Research Institute of Applied Microbiology, Obolensk; UDC 528.282.23.043]

[Abstract] NMR relaxation studies were conducted on lyophilized Saccharomyces cerevisiae cells which demonstrated that a slow transverse magnetization component—corresponding to water molecules with limited mobility—was due to interaction of trehalose with biopolymers. Most of the hydrogen bonds formed by trehalose in their spatial orientation yield structures reminiscent of water clusters and, therefore, fulfill the structure-building function following removal of water by lyophilization. Accordingly, lyophilization of yeast cells containing large concentrations of trehalose, such as those in the stationary phase of growth, does not entail major changes in cell structure and ensures stability and viability. Figures 5; tables 1; references 16: 12 Russian, 4 Western.

Methanogenic Bacillary Isolates in Tatar and West Siberian Oil Fields

927C0437C Moscow MIKROBIOLOGIYA in Russian Vol 61 No 2, Mar-Apr 92 (manuscript received 15 Apr 91) pp 299-305

[Article by I.A. Davydova-Charakhchyan, V.G. Kuznetsova, L.L. Mityushina and S.S. Belyayev, Institute of Microbiology, Russian Academy of Sciences, Moscow; UDC 559.72:579.851.017.7(470.41+571.1)]

[Abstract] Stratal waters derived from the Romashkinsky oil fields in Tataria and the Mykhpayskiy field in Western Siberia, the former characterized low mineral levels (10-40 g/L) and temperatures (30-40°C), and the latter by generally higher mineralization (20 g/L) and temperatures (60-80°C), were subjected to conventional bacteriologic assessment. Strains of methanogenic bacteria were isolated which gave good growth on $CO_2 + H_2$ mixture. Both isolates displayed high salt tolerance; the isolate from the Mykhpayskiy field was thermophilic and identified as a new strain of Methanobacterium thermoalcaliphilum. The mesophilic strain isolated from the Romashinskiy field was identified as Methanobacterium bryantii. However, in the case of the isolate identified as M. thermoalcaliphilum serological relatedness to other standard M. thermoalcaliphilum specimens was weak, suggesting the need for more refined techniques of identification. Figures 5; tables 1; references 20: 10 Russian, 10 Western.

Microbiological Characteristics of Oil Reservoirs on Mangyshlak Peninsula

927C0437E Moscow MIKROBIOLOGIYA in Russian Vol 61 No 2, Mar-Apr 92 (manuscript received 28 Jun 91) pp 316-322

[Article by T.N. Nazina, A.Ye. Ivanova and A. V. Blagov, Institute of Microbiology, Russian Academy of Sciences, Moscow; UDC 579.8:550.72(210.1)]

[Abstract] An analysis was performed on the hydrochemical characteristics and bacteriological composition of stratal waters recovered from the Uzen (55-74°C) and Zhetybay (60-78°C) oil deposits on the Mangyshlak Peninsula of Kazakhstan. The bacterial flora was characterized by trophically interrelated aerobic methane and hydrocarbon oxidizers and anaerobic sulfate and methane reducers. In addition, waterflooding with water at ambient (10-30°C) temperature at the Uzen field and heated water (70°C) at the Zhetybay field, a major protion of which is derived from the Caspian Sea, led to bacterial generation of significant quantities of H_2S approaching 113.3 mg/L in some cases. Since generation of H_2S has been shown to be a significant factor in corrosion of drilling equipment, the recommendation has been made to reduce the amount of sea water used in waterflooding, replacing it by trap water with a high mineral content. Such an approach would provide for more rational utilization of stratal waters and reduce formation of H_2S. Figures 1; tables 1; references 20: 13 Russian, 7 Western.

Damage and Death of *Francisella tularensis* During Slow Freezing

927C0443A Kiev PROBLEMY KRIOBIOLOGII in Russian No 4, Oct-Dec 91 (manuscript received 30 Jan 90) pp 10-16

[Article by V.Ya. Volkov, B.V. Sakharov and L.A. Volkova, All-Union Scientific Resarch Institute of Applied Microbiology, Obolensk, Moscow Oblast; UDC 539.143.43:577.352.3]

[Abstract] Nature of cell damage and death was investigated on *Francisella tularensis* subject to slow freezing in different

electrolytes, using data provided by NMR relaxation measurements, EPR spectra, and viability counts. The key factor in loss of viablity was membrane damage resulting from cell swelling in microchannels of unfrozen electrolytes formed in ice crystal lattices. Such damage occurs below the eutectic point of crystallization of a given salt (-10.5°C for KCl; -20.7°C for NaCl; -65.6°C for LiCl). Figures 3; tables 1; references 10: 7 Russian, 3 Western.

Batch Cultivation and Adhesiveness of S and R Mutants of *Salmonella Minnesota*

927C0445B Moscow ZHURNAL MIKROBIOLOGII, EPIDEMIOLOGII I IMMUNOBIOLOGII in Russian No 1, Jan 92 (manuscript received 16 Apr 91) pp 5-7

[Article by S.Ye. Vorkun, L.F. Novikova and O.A. Golubev, Ivanovo Medical Institute; UDC 579.842.14:579.23:576.524].083.13]

[Abstract] Adhesiveness, electrophoretic mobility and surface hydrophilicity of S and R mutants of *Salmonella minnesota* were analyzed in the course of batch culture at 37°C, pH 7.0, in tryptone-yeast extract medium. The results demonstrated that S cells in the stationary phase of growth had the most hydrophilic surfaces, while the R cells were uniformly hydrophobic. Similarly, highest electrophoretic mobilities were displayed by cells in the stationary phase and the lowest by cells at the end of the lag phase. In addition, S cells had the lowest mobilities, while mobilities of R cells increased in direct relation to loss of LPS core oligosaccharides: Ra < Rc < Rd < Re. Finally, cells with the highest electrophoretic mobilities also showed greatest adhesiveness to cover glasses. Figures 3; tables 4; references 10: 6 Russian, 4 Western.

Computer-Aided Cluster Analysis of Biological Characteristics of *Salmonella Typhimurium*

927C0445F Moscow ZHURNAL MIKROBIOLOGII, EPIDEMIOLOGII I IMMUNOBIOLOGII in Russian No 1, Jan 92 (manuscript received 12 Mar 91) p 70

[Article by O.V. Narvskaaya, V.A. Kaymanovich, V.V. Babkov and L.A. Kaftyreva, 1st Leningrad Medical Institute; Leningrad Ship Construction Institute; Leningrad Scientific Resarch Institute of Epidemiology and Microbiology imeni Pasteur; UDC 579.842.1:579.252.55]

[Abstract] Computer-aided cluster analysis was conducted on 55 strains of *Salonella typhimurium* in order to identify characteristics on the basis of which biovar classification could be accomplished. The resultant data demonstrated that biovars I, II_S and II_R can be identified on the basis of the following characteristics: virulence for mice, fermentation of D-tartrate, and antibiotic (neomycin and levomycetin) susceptibility. Individual strains were best differentiated by phage typing.

Behavior Modification in Rats by Microinjections of Vasopressin Into Inhibitory Brain Stem Centers

927C0434A Leningrad FIZIOLOGICHESKIY ZHURNAL SSSR IMENI I.M. SECHENOV in Russian Vol 77 No 8, Aug 91 (manuscript received 25 Feb 91) pp 33-38

[Article by S.V. Verevkina, Chair of Human and Animal Physiology, State University, Leningrad; UDC 612.821+612.343.14]

[Abstract] Behavioral sequelae of arg-vasopressin (AVP) administration into brain stem centers responsible for inhibition of motor activity were assessed on 200-250 g outbred male rats. The results demonstrated that administration of 0.01-0.1 ng of AVP into the medial parabrachial nucleus, nucleus cuneiformis, and raphe median and magnus nuclei inhibited motor activity induced by electric stimulation of the hypothalamus, as well as responsiveness to sound and other stimuli. Administration of 5,6-dihydroxytryptamine, a blocker of serotonin synthesis, into the raphe magnus nucleus 24 hours before AVP injection counteracted the effects of the latter. Accordingly, these observation suggest that the inhibitory sequelae of AVP administration entail activation of serotonergic mechanisms in the brain stem. Figures 2; references 20: 7 Russian, 13 Western.

Modulation of Electrical Rhythmicity of Rat Brain Formations by GABA Agonists and Antagonists

927C0434B Leningrad FIZIOLOGICHESKIY ZHURNAL SSSR IMENI I.M. SECHENOV in Russian Vol 77 No 11, Nov 91 (manuscript received 25 Feb 91) pp 12-20

[Article by A.V. Yarkov, V.V. Vorobyev and G.I. Kovalev, Laboratory of Medical Biophysics, Institute of Cell Biophysics, Pushchino, USSR Academy of Sciences; Laboratory of Neurochemical Pharmacology, Institute of Pharmacology, USSR Academy of Medical Sciences, Moscow; UDC 612.822+612.118.2]

[Abstract] Male Wistar rats, 300-350 g, were used in experiments designed to assess modulation of electical activity of the putamen, dorsal hippocampus, and the median and magnus raphe nuclei by various combinations of GABA, GABA agonists (muscimol, baclofen) and a GABA antagonist (biculcullin) administered into the lateral ventricles. Analysis of the 1-25 Hz band revealed that most of the changes affected the 7-16 Hz band, consisting predominantly of depression varying with the individual structures. In addition, biculcullin—an antagonist of $GABA_A$ receptors—attenuated the effects of muscimol ($GABA_A$ receptor agonist) and baclofen ($GABA_B$ receptor agonist). These observations illustrate the significance of GABAergic mechanisms in modulation of cerebral rhythmicity and the complex interaction of the various receptors. Accordingly, more refined analytical techniques will have to be developed for definitive conclusions as the the modulatory mechanisms. Figures 5; references 14: 4 Russian, 10 Western.

Behavior Modulation by Leu-Enkephalin and Synthetic Analog No 171 in Rats Differing in Ethanol Tolerance

927C0434C Leningrad FIZIOLOGICHESKIY ZHURNAL SSSR IMENI I.M. SECHENOV in Russian Vol 77 No 11, Nov 91 (manuscript received 05 Feb 91) pp 21-27

[Article by Yu.D. Lyashev, L.A. Severyanova and I.I. Bobyntsev, Chair of Pathologic Physiology, State Medical Institute, Kursk; UDC 612.821+661.772+577.15/.17]

[Abstract] Outbred rats differing in ethanol tolerance were used to further refine the behavioral role of endogenous opioids in an experiment involving intraperitoneal (5-100 μg/kg) and intragastric (0.2-1 μg) administration of leu-enkephalin (LEK) and compound No 171, a synthetic analog of LEK. Observation of the behavioral patterns of control and experimental rats revealed that treatment with LEK and No 171 increased the pain threshold to electric stimuli and attenuated affective aggressiveness of the male, 160-240 g, rats. The effects of the opioids were more pronounced in the alcohol-tolerant rats, and the most pronounced changes were seen in animals treated intraperitoneally with No 171. Both agents were less effective on administation in cerebral ventricles, with only No 171 (1 μg) yielding analgesia. The differences between the alcohol tolerant and intolerant rats receptors. Figures 3; tables 1; references 13: 6 Russian, 7 Western.

Impact of Monoclonal Antibodies (MA) on Sensorimotor Connections in Isolated Frog Spinal Cords

927C0438C Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 319 No 4, Aug 91 (manuscript received 20 May 91) pp 1012-1016

[Article by V.M. Kozhanov, M.N. Margulis, S.O. Gapanovich, Yu.V. Bobryshev, R.P. Ogurtsov, N.P. Veselkin and S.A. Dambinova, Institute of Evoqlutionary Physiology and Biochemistry imeni I.M. Sechenov and of the Human Brain, USSR Academy of Sciences, Leningrad; UDC 612.815+577.1]

[Abstract] IgG and IgM MAs directed against glutamate-binding membrane proteins derived from human brain tissue were assessed for their effects on the isolated frog (*Rana ridibunda*) spinal cord. Electrophysiological assessment of the L_9 segments showed that incubation with the IgG MAs resulted in blockage of the polysynaptic components of the sensorimotor postsynaptic potentials (SM-PSP). Concomitantly, the mono- and disynaptic components of SM-PSP were significantly potentiated in comparison with control recordings. The IgM MAs blocked only the initial phase, while potentiating the late polysynaptic components of the SM-PSP. Inhibition of the late components was attributed to inactivation of glutamate receptors on the synapses between afferent fibers and interneurons and, possibly, within the interneuron network and even on the motoneuron synapses. This interpretation was supported by immunofluorescent examination of MA-treated spinal cord sections. Figures 3; tables 1; references 13: 3 Russian, 10 Western.

Light-Induced Hydrogen Generation by Direct Electron Transfer From CdS Particles to Isolated *Thiocapsa Roseopersicina* Hydrogenase

927C0440G Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 319 No 1, Jun 91 (manuscript received 11 Mar 91) pp 242-245

[Article by V.V. Nikandrov, A.I. Aristarkhov, M.A. Shlyk and A.A. Krasnovskiy, academician, Institute of Biochemistry imeni A.N. Bakh, USSR Academy of Sciences, Moscow; UDC 577.1]

[Abstract] Powdered form of the semiconductor CdS was employed in testing for light-induced direct electron transfer from CdS to hydrogenase and generation of H_2. The experimental setup involved CdS coated with hydrogenase isolated from *Thiocapsa roseopersicina* and dithiothreitol as electron donor in 0.06 M phosphate buffer, pH 6.5. selection of CdS was based on its absorption of light at $\lambda < 500$ nm. Illumination with light from a marcury lamp (365 nm) led to generation of H_2 in direct proportion to light intensity. Less efficient generation of H_2 was also obtained with cysteine, glycine, methanol, and EDTA as the electron donors. Addition of methyl viologen to facilitate electron transfer between CdS and the enzyme enhanced H_2 generation seven- to 20-fold. The limiting stage in the direct transfer of electrons from CdS to hydrogenase was felt to be unfavorable orientationn of adosorbed hydrogenase molecules on the semiconductor surface. The demonstration of direct electron transfer in between an inorganic semiconductor and an enzyme advances further the concept of photobiocatalysts, biosensors, and bioelectronic devices. Figures 3; references 14: 6 Russian, 8 Western.

Peripheral Localization of Enkephalin Immunoreactive Neurons in Flying Snails

927C0440H Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 319 No 2, Sep 91 (manuscript received 18 Apr 91) pp 502-504

[Article by D.A. Sakharov and R. Elofsson [as published], Institute of Developmental Biology imeni N.K. Koltsov, USSR Academy of Sciences, Moscow; Department of Zoology, Lund University, Sweden; UDC 591.881:594.35]

[Abstract] Immunocytochemical staining was employed in studies on adult and larval flying snails (*Clione limacina*) to ascertain presence and localization of endogenous opioids and to determine the suitability of this species for opioid research. Although examinations with antisera against met-enkephalin had previously been reported to be negative, present studies with Incstar Corp. antiserum against leu-enkephalin yielded positive results. In particular, the paired buccal cones (head cones) were richly stained, as were a few bipolar neurons within the buccal cavity on the surface of the radular complex. Consequently, these findings suggest that leu-enkephalin may be involved in sensory transmission and that the flying snail may serve as a model for such studies. Figures 3; references 12: 3 Russian, 9 Western.

Calcium and Camodulin Mechanisms in Sensitization of Edible Snail

927C0440I Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 320 No 1, Sep 91 (manuscript received 13 Apr 91) pp 236-241

[Article by V.P. Nikitin, M.O. Samoylov and S.A. Kozyrev, Institute of Normal Physiology imeni P.K. Anokhin, USSR Academy of Medical Sciences, Moscow; Institute of Physiology imeni I.P. Pavlov, USSR Academy of Sciences, Leningrad; UDC 595.1]

[Abstract] The edible snail (*Helix pomatia*) was selected for experiments designed to delineate the role of calcium and calmodulin in one of the simplest forms of learning—sensitization. Interpretation of the results was based on data derived from action potential measurements from defensive command neurons LPl1 and PPl1 in combination with the impact of the calmodulin blocker W7 (N-(6-aminohexyl)-5-chloro-1-naphthalene-sulfonamide) on the withdrawal response. Sensitization with 50 percent quinine had a triphasic effect: 1) two- to three-fold prolongation of withdrawal duration to tactile and chemical (0.1 percent) stimuli; 2) after one hour a 1.5- to two-fold decrease in withdrawal duration; and 3) after an additional 30-60 min return to step one type of effect. Use of W7, measurement of electrical activities, and determination of calcium concentrations demonstrated that, on balance, attenuation of calcium/calmodulin mechanism inhibited selected short- and long-term sequelae of sensitization, but that interference with these mechanisms after sensitization had no effect on long-term sequelae. Consequently, the metabolic status of the calcium/calmodulin system may have a direct or an indirect impact on synaptic mechanisms. Figures 4; references 15: 7 Russian, 8 Western.

Bioflavonoid Modulation of Enzymatic Antioxidant Mechanisms

927C0443D Minsk ZDRAVOOKHRANENIYE BELORUSSII in Russian No 10, Oct 91 (manuscript received 14 May 91) pp 31-32

[Article by I.G. Sokolchik, V.K. Kukhta, E.I. Oletskiy, L.P. Lisitsina, Z.O. Polyakova and T.V. Vasilkova, Chair of Biochemistry, Minsk Medical Institute; UDC 615.322+615.356]-02:577.125]

[Abstract] Rutin and *Sophora japonica* bioflavonoid extract were administered to oubred rats in order to assess their effects on enzymatic antioxidant mechanisms in several tissues and organs and determine their potential as therapeutic agents. On an overall basis, intragastric administration of 40 or 120 mg/kg of rutin or the extract to 150-180 g outbred male rats enhanced superoxide dismutase and catalase activities in a dose-related fashion. In general, the bioflavonoid extract from *Sophora* was more effective than rutin, but both agents appear to be potentially useful in limiting cell damage due to superoxide radicals and hydrogen peroxide. Tables 1; references 6: Russian

Status of Burn Services in the Uzbek SSR

927CO435A Tashkent MEDITSINSKIY ZHURNAL UZBEKISTANA No 11, Nov 91 pp 3-5

[Article by R.T. Sultanov, S. N. Navruzov, Ye. Ye. Yarugskiy, and V. M. Kalinin, UzSSR Ministsry of Health; UDC 617.-001.07-84]

[Text] A considerable increase in the number of burn wounds has been noted in the republic during recent years. In contrast to the other regions of the country, children in the UzSSR have accounted for more than one-half of the burn victims.

The number of self-inflicted burns on the part of rural women has been particularly alarming inasmuch as these wounds are basically fatal. However, this problem is more of a social rather than medical problem.

During the last decade the republic's health authorities have undertaken particular measures to improve medical assistance to burn victims. The Republic Burn Center (ROTs - Respublikanskiy ozhogovoy tsenter [hereafter abbreviated ROTs]) was created in 1986 to accommodate 100 beds. The structure, staffing, and statutes regarding these centers have been approved. Road lectures for physicians specializing in burns were organized in May and June, 1988 by the Kiev Institute for the Advanced Training of Physicians based at the ROTs. The Department for Burn Recovery was opened at the ROTs in 1990. The Tashkent municipal burn center (Tashkent GOTs) was subsequently organized. New and effective methods for the treatment of burns were developed and introduced into clinical practice, such as open nondressing treatment of burn victims that employ aerotherapeutic equipment and infrared irradiation, immunotherapy, early osteonecrectomy with simultaneous autodermoplasty, closure of defects in cranial osteonecroses by a bridge flap, plastic surgery for cervical cicatrix deformations by "epaulette" and cervical-thoracic dermo-fascial flaps, extracorporal detoxication (hemosorption, biohemosorption on a xenospleen), intravasal laser irradiation of blood, magnetotherapy, autodermoplasty by reticular transplants, correction of metabolic defects by parenteral and internal feeding. Hyperbaric oxygenation procedures are being learned. All types of reconstructive surgical procedures for burn victims, including the use of distraction equipment are being carried out at the ROTs, the Tashkent municipal burn center, the oblast burn centers, and the burn treatment centers of the republic..

The health authorities of the republic have been making considerable efforts to increase the bed capacity of specialized burn center facilities and to improve their efficiency. For example, in the last ten years the bed capacity of burn centers in the republic almost tripled (from 220 to 620).

At the present time almost all oblasts of the republic (except the Syrdar Oblast) have burn treatment centers. The actual requirement for burn center beds in the republic is 820 (representing 495 adult and 325 pediatric beds). The republic's per capita burn victim bed capacity is 0.26 per 10,000 inhabitants while the normal per capita level is 0.4 per 10,000. If that level is taken as a base, the situation in the UzSSR, like the situation in the RSFSR, the Ukraine, and Belorussia, can be considered relatively favorable inasmuch that index is lower in the remaining republics (0.1 in Azerbaijan).

The situation with respect to the disposition of the burn treatment centers is considerably worse. Thus, 20-bed burn treatment center in Dzhizak is situated in a building that is not suitable for rendering assistance to burn victims. The low level of personnel skills, the lack of elementary work conditions, equipment, and supplies have been creating considerable difficulties in the treatment of burn victims. The burn treatment centers in Andizhan, Bukhara, Namangana, and Karshi are operating under substandard conditions. Hygienic standards are not being maintained in any of the burn treatment centers. Even in the ROTs the total ward space is only one-fourth the standard level (the ward space there is only three square meters per patient whereas the standard level is 14 sq. meters per patient). The pediatric division has no place for beds to accommodate mothers caring for their children. The bacteriology laboratory occupies a considerable space of the ROTs facility. This leaves no room for a reconstructive surgery department, a decontamination center, laser therapy and magnetotherapy laboratories, LFK, or other laboratories.

At the same time there has been a recent positive trend in the provision of resuscitation services to patients recovering from burn shock.

More than one-half of the 20,681 burn victims who were admitted to the republic's burn treatment centers were children (11,608). The republic has only two pediatric burn treatment centers (a 60-bed facility at the ROTs and a 30-bed facility at the Tashkent ROTs). Even at the most modest national standards (0.15 pediatric beds per 10,000 population) there is a shortage of 325 pediatric burn treatment beds.

The leadership of the oblast health departments and the ispolkoms of the oblast soviets have not been undertaking the necessary measures to carry out the resolution of the UzSSR Ministry of Health Board No. 9/63 dated 31 Aug 1990 pertaining to the creation of pediatric burn treatment centers and the placement of oblast facilities for this purpose.

The high mortality rate for burn victims continues. Thus, in 1989 the patient mortality rate among discharged adults and juveniles was 4.28 and 2.6 for children which is 1.5 times higher than average national indices (2.4 and 1.6 respectively). With respect to burn mortality the republic is on par with Georgia, Azerbaijan, Tadjikistan, and Turkmenia. This is associated to a considerable degree to the poor material-technical base and insufficient supplies of medication at the burn treatment centers. Automated control systems [ATY-1] are available only at the ROTs, Andizhan, Khorez, and Bekabad burn treatment centers. Requisitions for the ATY-1 are not being fulfilled. Dermatomes and perforators for skin flaps are not being received. At the present time the republic has only three "Clinitron" beds for the treatment of burns (one at the ROTs and one in Urgench). There is a considerable shortage of probes and

roller pumps for internal feeding. There is also a shortage of temporary dressings, lyophillized xenoskin, and disposable syringes.

Due to the abrupt reduction in the delivery of blood substitutes from other republics and the existing problems related to blood donations, the burn treatment centers are poorly supplied with hemodynamic and detoxifying blood substitutes, amino acid mixtures, and blood preparations (albumin, protein, plasma, and hyperimmune plasma). There is an insufficient supply of antiseptics, antiaggregates, anticoagulants, inhibitors, proteases, and water-soluble ointments.

The implementation of measures to improve the burn treatment services in the republic as stipulated in the aforementioned resolution of the UzSSR Ministry of Health Board essentially depends upon the local authorities and the supervisors of the oblast health departments as well as the "Uzmedtekhnika" and "Farmatsiya" republic industrial associations. The industrial and agricultural enterprises as well as cooperatives and philanthropic societies can accord significant financial assistance.

The medical staffing of the republic's burn treatment centers can be considered to be satisfactory. Most of these staff physicians have taken training courses at the TsOLIUV [Central Oblast Institute for the Advanced Training of Physicians and the Kiev Institute for the Advanced Training of Physicians. However, in connection with the planned expansion of bed facilities and the opening of new burn treatment centers, there will be a need for the local training of burn specialist personnel, rehabilitation specialists and the training of special surgery personnel and first aid specialists in rendering aid to burn victims at evacuation stages.

An apprenticeship course (126-hour program) on "Thermal Wounds" has been jointly organized by the ROTs and Tashkent Institute for the Advanced Training of Physicians.

Problems pertaining to the social, psychological, and medical rehabilitation of burn victims, most of whom become invalids, represent an acute issue. However, as of the present time the republic does not offer the services required to resolve those problems. © MEDITSINSKIY ZHURNAL UZBEKISTANA, 1991

Government Sets Price Limits for Medicine

OW2507131992 Moscow INTERFAX in English 1218 GMT 25 Jul 92

[Item transmitted via KYODO]

[Text] The Uzbek cabinet has decided to allocate in its budget rb [ruble] 250 mn [million] to subsidize the discrepancy between the wholesale and retail prices for pharmaceutics. This is made necessary by CIS producers who supply the republic with medicines at prices that people cannot afford. Ceilings have been fixed on 130 preparations, such as cardiac, hormonal, antibiotic, and anti-fever pills.

To solve the problem imports have been suggested from Hungary, Turkey, India. Talks are in train [as received] for purchases from Italy, Germany, and Bulgaria.

West-Donated Medicines Often Past Expiration Date

LD2707042192 Moscow Radio Rossii Network in Russian 0300 GMT 27 Jul 92

[Text] Sixty percent of medicines received recently from abroad via humanitarian aid are either close to or have already past their expiration dates. IMA-PRESS reported this at a news conference with the head of the Kaliningrad Oblast.

Bashkir Green Faction Urges Aid for Population

PM2707110792 Moscow IZVESTIYA in Russian 23 Jul 92 Morning Edition p 2

[Report by Radik Abdullin: "Bashkortostan's Wealth Becomes a Calamity"]

[Text] Ufa—That is the burden of a programmatic statement just adopted by a new Bashkortostan Supreme Soviet parliamentary faction "Land and Oil."

According to the deputies, the republic, which has been over recent decades one of Russia's main oil-extraction and oil-refining centers, has become an ecological disaster area, instead of an area of prosperity. Many population centers in its oil areas are now without drinking water. There is an increased incidence of cancer and of children born with genetic defects.

In order to eliminate this situation, the "Land and Oil" parliamentary faction is demanding that over a period of five years one-half of all the money from the sale of the oil produced in the region should be used to maintain ecological stability, and it has presented an initiative on the creation of a special "Heritage Foundation" to support the badly-off strata of the population in the oil-producing areas.

Advertisement of Russian Trade Company

SK0607150992 Moscow Radio Moscow in Korean 1200 GMT 3 Jul 92

[Text] This is a commercial advertisement. Do you need any traditional medicine from Tibetan pharmaceutical companies, antlers from Polar [as heard] deer or Siberian deer, or bear's gall? Do you have any plans to establish a joint venture production plant to produce efficacious pharmaceuticals? If you do, you can contact Inter West, a Russian trade company, and you will not regret it.

As a general trading company, Inter West is able to provide various services. Once you have dealings with the Russian trade company, Inter West, you will see that the company has greater capabilities than you expected.

Please write down the address and fax and telex numbers of this company in Moscow. The address is Room #815-#823, 12 (Belle Ruloke), (Okiyabriskiy), Moscow. The fax number is 292-65-11, and the zip code is 17894 Inter West. The telex number is 411-700, and the zip code [as heard] is 86 (Brugels).

Aspects of Panic Expression Under Conditions of Ecological Disaster

927C0425A Moscow PSIKHOLOGICHESKIY ZHURNAL in Russian Vol 13 No 2, Mar-Apr 92 pp 66-74

[Article by V. A. Molyako]

[Abstract] This paper examines some of the general characteristics of "normal" panic in its analysis of the post-Chernobyl radiation panic. The article is specifically devoted to analysis of ongoing latent atomic panic, especially among Kievans. The author claims that the reasons for panic include the following: 1. unique nature of accident; 2. poor preparation of the people to act rationally in the face of atomic danger; and 3. lack of specific information. By comparison, the panic was not as great in Kiev as it was in Chernobyl, since there were no visible signs of danger. However, latent, long-term radiation panic developed, generated by fear of the effects of large and small radiation doses on the body. Analysis of the data suggested that the expression of latent Chernobyl radiation panic was due to: 1. complete uncertainty of the effect of radiation on man; 2. fear of possible subsequent problems at the power plant; 3. fear of contamination of water, food, air, etc.; 4. lack of true, complete information; 5. lack of medical observation, consultation; and 6. rumors of death, disease. In conclusion, individuals suffering from latent post-Chernobyl radiation panic may display one or more of the following signs: 1. desire to leave radiation-contaminated city, get "clean" food, etc.; 2. heightened attention to discussion of radiation; and 3. increased hypochondria about their personal well-being and that of relatives. Figures 2; references 18: 17 Russian, 1 Polish.

Impact of Catecholaminergic Compounds on Embryonal Motility of Bony Fish *Aequidens pulcher (Cichlidae)*

927C0425B Moscow ZHURNAL OBSHCHEY BIOLOGII in Russian Vol 53 No 2, Mar-Apr 92 (manuscript received 10 Apr 91) pp 258-271

[Article by I. V. Nechayev, Yu. A. Labas, and V. A. Denisov, Institute of Evolutionary Morphology and Ecology of Animals imeni A. N. Severtsov, Russian Academy of Sciences, Moscow; UDC 577.15/.17.577.95.591.392.597.5]

[Abstract] The objective of this investigation was to determine the effect of catecholaminergic preparations on different types of embryonal motility throughout the development of bony fish embryos (*Aequidens pulcher*) raised in an aquarium with a water temperature of 26°C. The researchers gathered seven to eight roes 15 minutes after fertilization and every three hours thereafter to describe ten consecutive stages of embryogenesis. The effect of each substance was tested on 320 eggs from four different clutches. The results demonstrated that adrenalin and phentolamine in any concentration had no effect on either early embryonal motility or heart rhythm. However, haloperidol, a dopamine receptor blocker, began acting the earliest by stopping the epiboly of the germinal disk. It was also shown that L-DOPA and amomorphine [as published] decrease the pulse of the germinal disk in the embryo without altering the pace of epiboly. The data in this study confirm the function of catecholamines in regulating embryonal motility and the developing myocardium even before the appearance of the nervous system. The results also confirm the specifics and clearly marked time sequence of the effect of different catecholaminergic mediators and their agonists and antagonists on the embryo. The findings revealed that the dopaminergic system apparently begins to function from the first divisions of the egg cell, much earlier than the noradrenergic system. In contrast, the effect of the adrenalin activation of phosphorylase in rats is displayed three weeks after birth, which is attributed to the relatively slow development of the gated system of the ion channel in the plasmalemma. Figures 6; tables 2; references 34: 19 Russian, 15 Western.

An EIA Diagnostic Test-System for the Detection of Anti-HAV IgM in Serum Samples

927C0442E Riga IZVESTIYA AKADEMII NAUK LATVIYSKOY SSR in English No 10, Oct 91 pp 91-95

[Article by T. N. Tsibinogina, V. Ya. Saulite, A. A. Vitinya, and V. A. Levitskiy, Institute of Microbiology, Latvian Academy of Sciences]

[Abstract] An ELISA test has been developed and used successfully at the Institute of Microbiology for the detection of acute hepatitis A. Sensitivity and specificity are similar to Abbott's HAVAB-M kit, and the new ELISA test offers a number of advantages over the DiagnAhep kit. The serum to be tested is adsorbed onto a solid phase such as a polystyrene plate sensibilized with antibodies to human IgM. The HAV Ag and the conjugate of the anti-HAV IgM with HRPO are then adsorbed. If the serum being tested contains the anti-HAV IgM, a bright color appears after the substrate is added. Among the principal advantages offered by the system is the fact that the preparations of antibodies to human IgM obtained in the work reported here can be used in various test systems for rapid detection of a number of acute human viral and bacterial infections. The system can be used to detect hepatitis A in its anicteric and subclinical forms. Figures 2, references 8: 3 Russian, 5 Western.

Impact of Cell Culture on Immunogenicity of Tick-Borne Encephalitis Virus (TBEV)

927C0445C Moscow ZHURNAL MIKROBIOLOGII, EPIDEMIOLOGII I IMMUNOBIOLOGII in Russian No 1, Jan 92 (manuscript received 15 May 90; in final form 15 May 91) pp 25-28

[Article by L.B. Elbert, M.F. Vorovich, Ye.N. Terletskaya, Ye.A. Lisitsina, S.N. Atanadze, I.G. Sidorovich, V.V. Khozinskiy, Sh.M. Tugizov, A.A. Kushch, Yu.Kh. Khapchayev and A.V. Timofeyev, Scientific Research Institute of Poliomyelitis and Viral Encephalitides and the Institute of Virology imeni D.I. Ivanovskiy, USSR Academy of Medical Sciences; Institute of Immunology, USSR Ministry of Health, Moscow; UDC 615.371:578.833.26.083.13].92.9]

[Abstract] A comparative assessment was made of the impact of the type of cell culture on immunogenicity of TBEV and its major surface protein—protein E—as a factor to be considered in vaccine production. The results demonstrated that immunization of BALB/c mice with formalin TBEV vaccines and protein E prepared from cultures of green marmoset kidneys cells and chick embryo fibroblasts was ten-fold as effective as immunization with the analogous immunogens prepared from porcine kidney cells. Studies with polyclonal and monoclonal antibodies against protein E led to the conclusion that diminished immunogenic potential of protein E derived from TBEV grown in the pig kidney cells was due post-translational modifications which, however, did not affect in vitro antibody binding characteristics. Figures 2; tables 2; references 14: 5 Russian, 9 Western.

Antibacterial Immunity in Relation to Changing Radiation Backround

927C0445D Moscow ZHURNAL MIKROBIOLOGII, EPIDEMIOLOGII I IMMUNOBIOLOGII in Russian No 1, Jan 92 (manuscript received 04 May 90; in final form 24 Apr 91) pp 33-36

[Article by S.I. Bidnenko, L.V. Nazarchuk, Ye.A. Fedorovskaya, O.B. Lyutko and L.B. Openko, Scientific Research Institute of Epidemiology and Infectious Diseases imeni L.V. Gromashevskiy, Ukrainian SSR Ministry of Health; Scientific Research Institute of Hematology and Blood Transfusion, Kiev; UDC 612.017.1.06:614.876]

[Abstract] Status of antibacterial immunity was assessed in Kiev before and after the 1986 Chernobyl accident, in which the average exposure during the first year was 1.07 rem. Assessment was performed in terms of antibody titers unrelated to immunization or infection, involving a cohort of 2265 persons, largely 20-50 year old men. The average antibody titer in PHI tests against *Proteus mirabilis, Pr. vulgaris, Staphylococcus aureus* α-toxin, and *Pseudomonas aeruginosa* prior to the accident was 1:8. Six months after the accident the mean titer was 1:43, rising to 1:171 after one year, then falling to 1:90 after two years and to 1:74 after three years. Evaluation of the results in relation to ABO blood groups yielded variable results which were difficult to interpret; at one time or another different blood groups were correlated with the highest titers. On balance, the rise in antibacteria antibodies in the population was attributed to the fact that low levels of radiation tend to inhibit T-suppressor cells, facilitating thereby antibody synthesis. Tables 2; references 9: Russian.

Comparative Diagnostic Utility of Polyclonal and Monoclonal Antibodies Against Anti-Hepatitis IgM Antibodies in Enzyme Immunoassays

927C0445E Moscow ZHURNAL MIKROBIOLOGII, EPIDEMIOLOGII I IMMUNOBIOLOGII in Russian No 1, Jan 92 (manuscript received 25 Apr 91) pp 36-39

[Article by T.N. Tsibinogina, V.A. Levitskiy and V.Ya. Saulite, Institute of Microbiology imeni A. Likhenshteyn, Latvian Academy of Sciences, Riga; UDC 616.98:578.8]-036.11-07:616.153.962.4-097-078.333]

[Abstract] A comparative analysis was conducted on the diagnostic utility of polyclonal and monoclonal IgG antibodies against IgM in enzyme immunoassays for anti-HBc and anti-HAV IgM antibodies. Binding affinities (K = ca. 10^{13} L/M) and specifities of the polyclonal and monoclonal antbodies were essentially identical, showing that both were equally useful for diagnostic purposes. However, the advantages of the monoclonal IgG antibodies included their relatively simpler isolation by ammonium sulfate precipitation of ascitic fluid rather than affinity chromatography, and the fact that they represent a highly standardized reagent. Tables 3; references 12: 3 Russian, 9 Western.

Space Industries Conversion to Civilian Economy Viewed

LD2507111592 Moscow Teleradiokompaniya Ostankino Television First Program Network in Russian at 1425 GMT 24 Jul 92

[Editorial Report] A 15-minute documentary on the Zashchita Center for Emergency Medical Aid, part of the closed Institute of Biophysics of the Ministry of Health, examines some of the items it has developed and describes the new role it is creating for itself as the conversion of the defense industries gathers pace.

"The veil of secrecy is gradually being lifted." The Institute of Biophysics carried out work for the Ministry of Medium Machine Building and the Ministry of General Machine Building. Behind these innocuous labels were, respectively, the nuclear industry and space rocket technology in the former USSR, the voice-over said.

[Video shows interior and exterior shots of the Zashchita center] A.N. Nemtsev, first deputy director of the center, which is located in Moscow's Zhivopisnaya Street, said in an interview that following the center's creation, part of the institute's work has been declassified and is being used in the center's practical activities. The chief aim is to provide emergency medical and public health aid in various types of emergencies—radiation accidents and chemical accidents on sites managed by the Chief Directorate for Medical, Biological, and Extreme-Condition Problems, as well as other man-made and natural disasters. Recently the center sent out a mobile hospital to Vladikavkaz and Tiraspol to help the injured.

V.V. Polyakov, doctor and cosmonaut, shown standing in front of a man being fitted with straps, commented that the device being demonstrated concentrates the blood in the lower part of the body to counteract the effects of weightlessness, which causes the blood to collect in the upper part of the body.

A.S. Yarov, captioned as the laboratory head, showed an item of comfortable space-wear consisting of an inner lining of cotton and synthetic knitted material on the outside that does not cause dust that could block filters. A warm but lightweight knitted space-suit made of fibers described as hygienic was also shown: again cotton-lined, with an outside layer of polyester fiber, and a thin layer of dust-free wool sandwiched in between.

The voice-over said that at the moment "there is no question" of these items being put into industrial production as many former suppliers now find themselves in different countries, such as Lithuania and the Ukraine, and "certainly aren't consumed by a desire to cooperate for nominal payment, as was the case before." The small Moscow enterprise Agava manufactures space-clothes and suits for the emergency medical teams "literally by the piece." Other protective wear developed at the institute includes disposable and washable suits for use at atomic power stations. There are protective suits for use at special chemical plants where rocket fuel is manufactured—the institute has developed material that repels hot splashes. Anti-gravity-force suits for pilots are also made here. [Video shows seamstresses at work at the Agava factory. Various types of protective suits are shown on display]

L.R. Iseyev, doctor of medical sciences, said that at a "unique" aerospace medicine and high-altitude physiology complex, which has been functioning for around 15 years, there are two chambers. One can rarefy the air to around 10 to the power of minus 3, which is equivalent to around 50 km above sea level. In the vertical chamber, which is designed for testing high-altitude equipment, a deep vacuum of 10 to the power of minus six can be created—the equivalent of an altitude of around 250 km. This chamber has proved very effective for treating various diseases—bronchial asthma, allergic dermatitis, and certain mental disorders. In future, the chamber will be used for public health purposes, he says.

The voice-over said an ordinary pressure chamber could be used for medical purposes, but "in the absence of orders and financing, people manage as best they can." The Energiya scientific-production association in the Moscow region is forced to manufacture fitted kitchens. The Samara Progress rocket factory makes automatic sausage machines. "Conversion is undoubtedly needed—but it is still an open question whether it has gone in the right direction." The Emergency Medical Aid Center has been using the expertise of the Institute of Biophysics to set up rapid reaction teams and equip them with the necessary equipment. At the time of the Chernobyl disaster, a special government decision gave the go-ahead for a main coordinating center in Moscow and regional branches initially throughout the Soviet Union, now Russia. Incoming information is monitored and processed, and emergency aid teams are on constant alert. The Zashita center is "far behind" similar Western organizations, but the intellectual and industrial potential of defense science and technology should allow it to catch up, the commentary concluded. [Video: Final shots show rescue teams at work in various disaster areas]

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